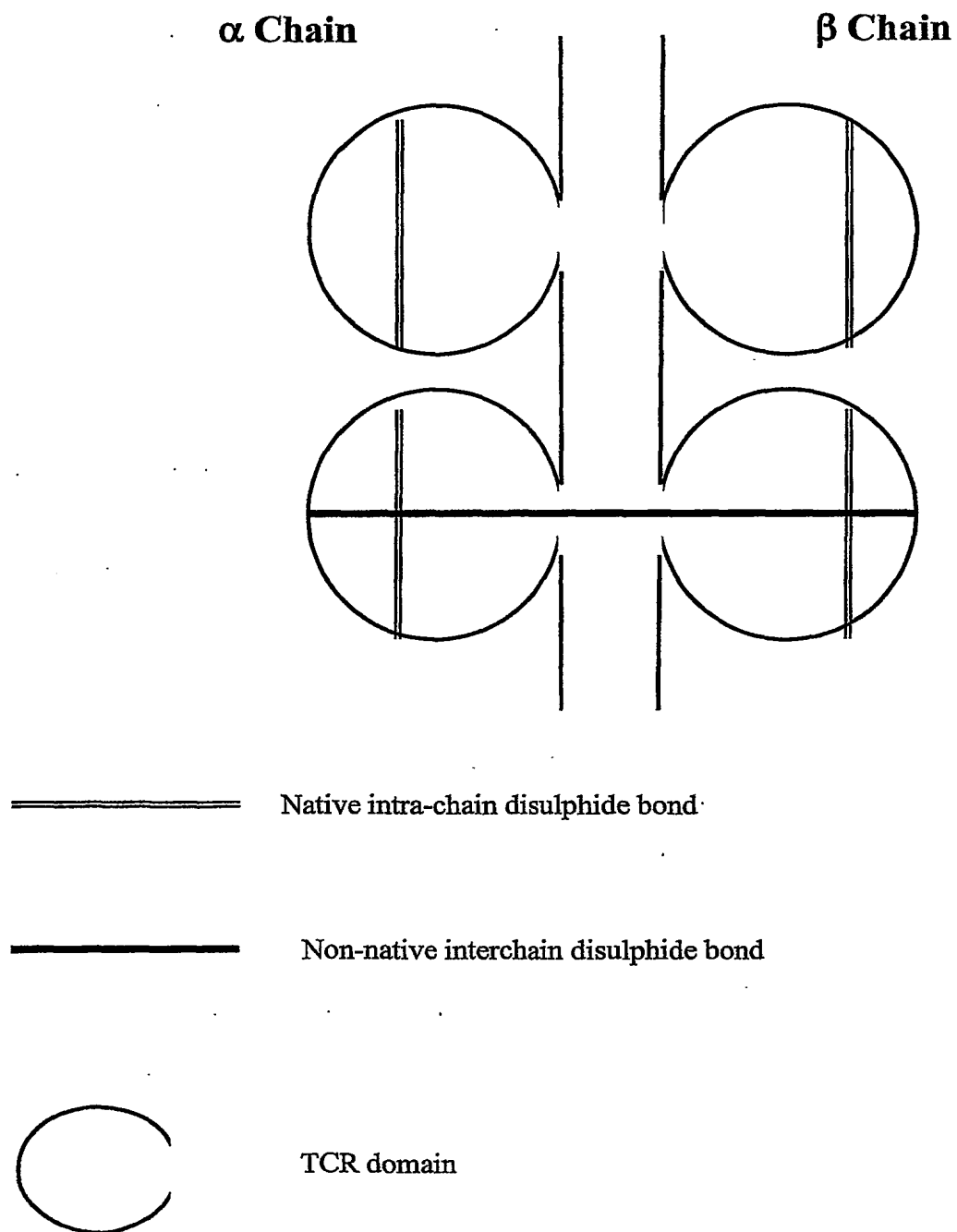


Figure 1



**Figure 2a**

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gatggaaggtttacagcacagctcaataaagccagccagtatgtttctctgctcatca  
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**Figure 2b**

atgaacgctggtgtcactcagacccccaaaattccaggtcctgaagacaggacagagca  
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agtccagttctacgggctctcggagaatgacgagtggaaccaggatagggccaaaccc  
gtcaccacagatcgtcagcgccgaggcctggggtagagcagactaa

Figure 3a

MQ

K<sub>1</sub>EVEQNSGPL SVPEGAIASL NCTYSDRGSQ SFFWYRQYSG KSPELIMSIY  
SNGDKEDGRF TAQLNKASQY VLLIRDSQP SDSATYLCAV TTDSWGKLQF  
GAGTQVVVTP DIQNPDPVY QLRDSKSSDK SVCLEFTDFS QTNVSQSKDS  
DVIITDKCVL DMRSMDFKSN SAVAWSNKSD FACANAFNNS IIPEDTFFPS  
PESS\*

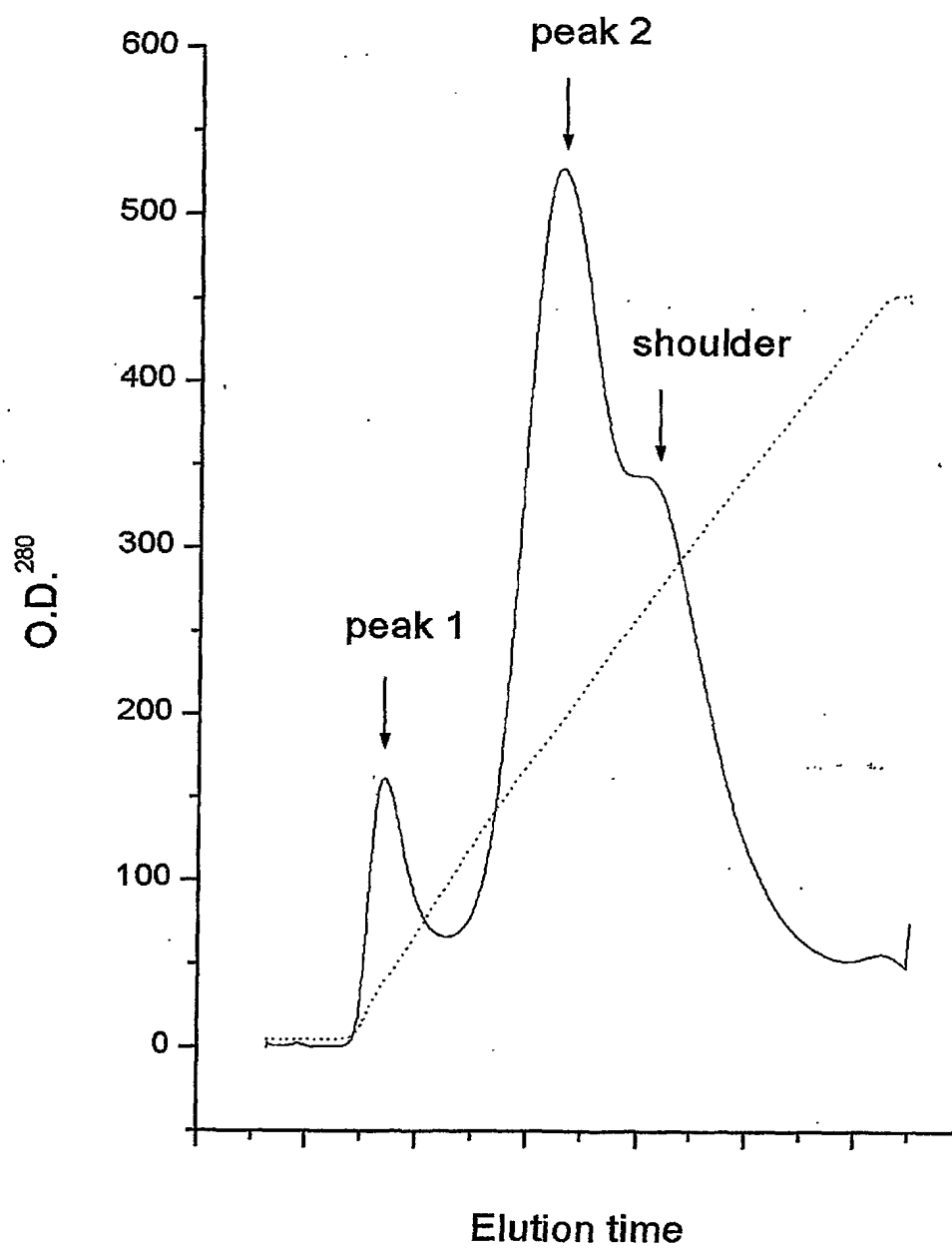
Figure 3b

M

N<sub>1</sub>AGVTQTPKF QVLKTGQSM T LQCAQDMNHE YMSWYRQDPG MGLRLIHYSV  
GAGITDQGEV PNGYNVSRST TEDFPLRLLS AAPSTSVYF CASRPGLAGG  
RPEQYFGPGT RLTVTEDLKN VFPPEVAVFE PSEAEISHTQ KATLVCLATG  
FYPDHVELSW WVNGKEVHSG VCTDPQPLKE QPALNDSRYA LSSRLRVSAT  
FWQDPRNHFR CQVQFYGLSE NDEWTQDRAK PVTQIVSAEA WGRAD\*

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Figure 4



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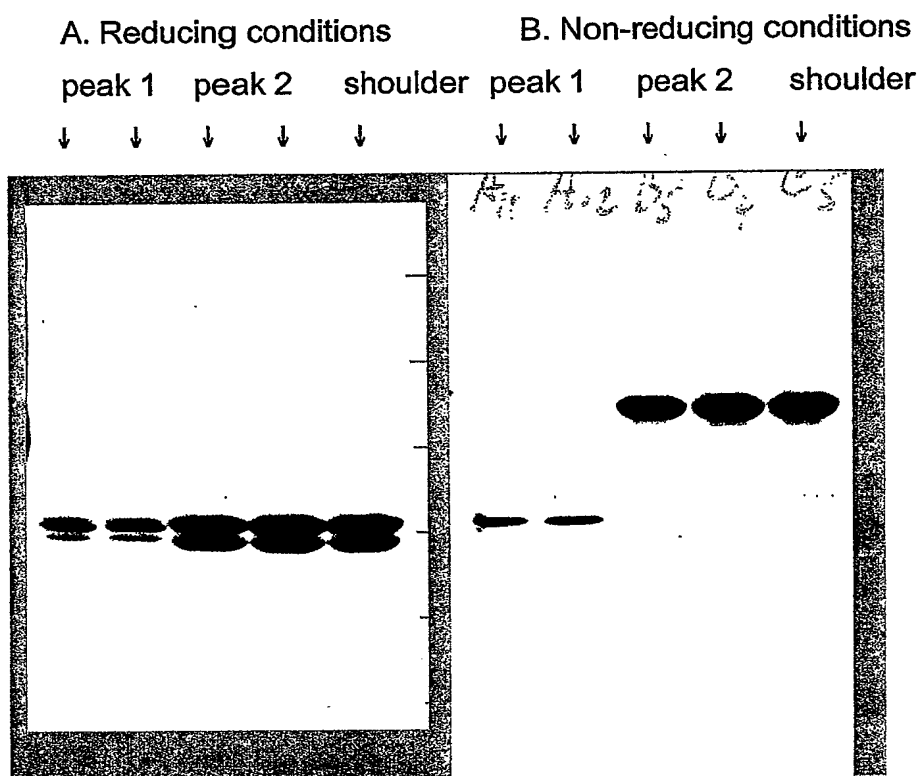
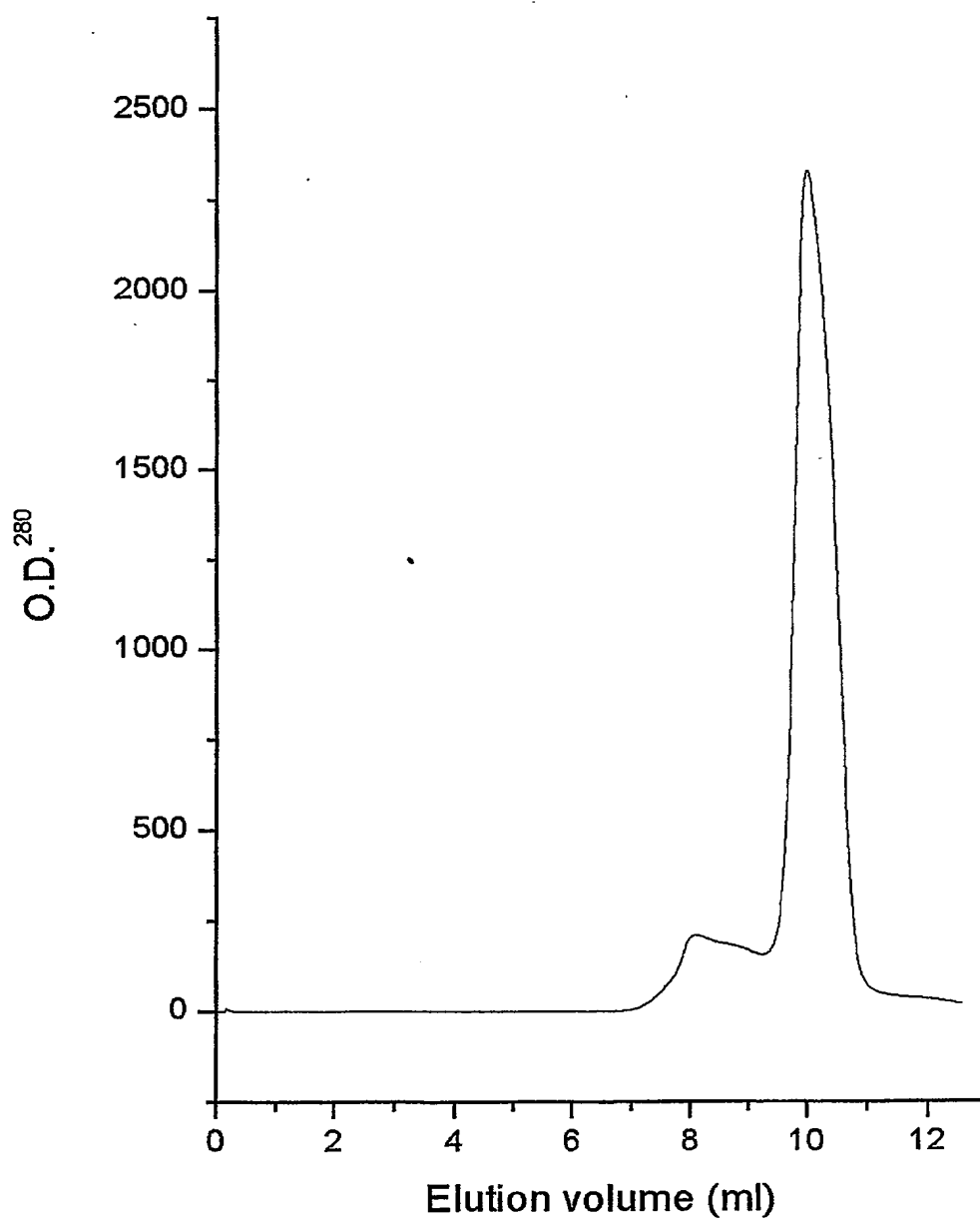


Figure 5

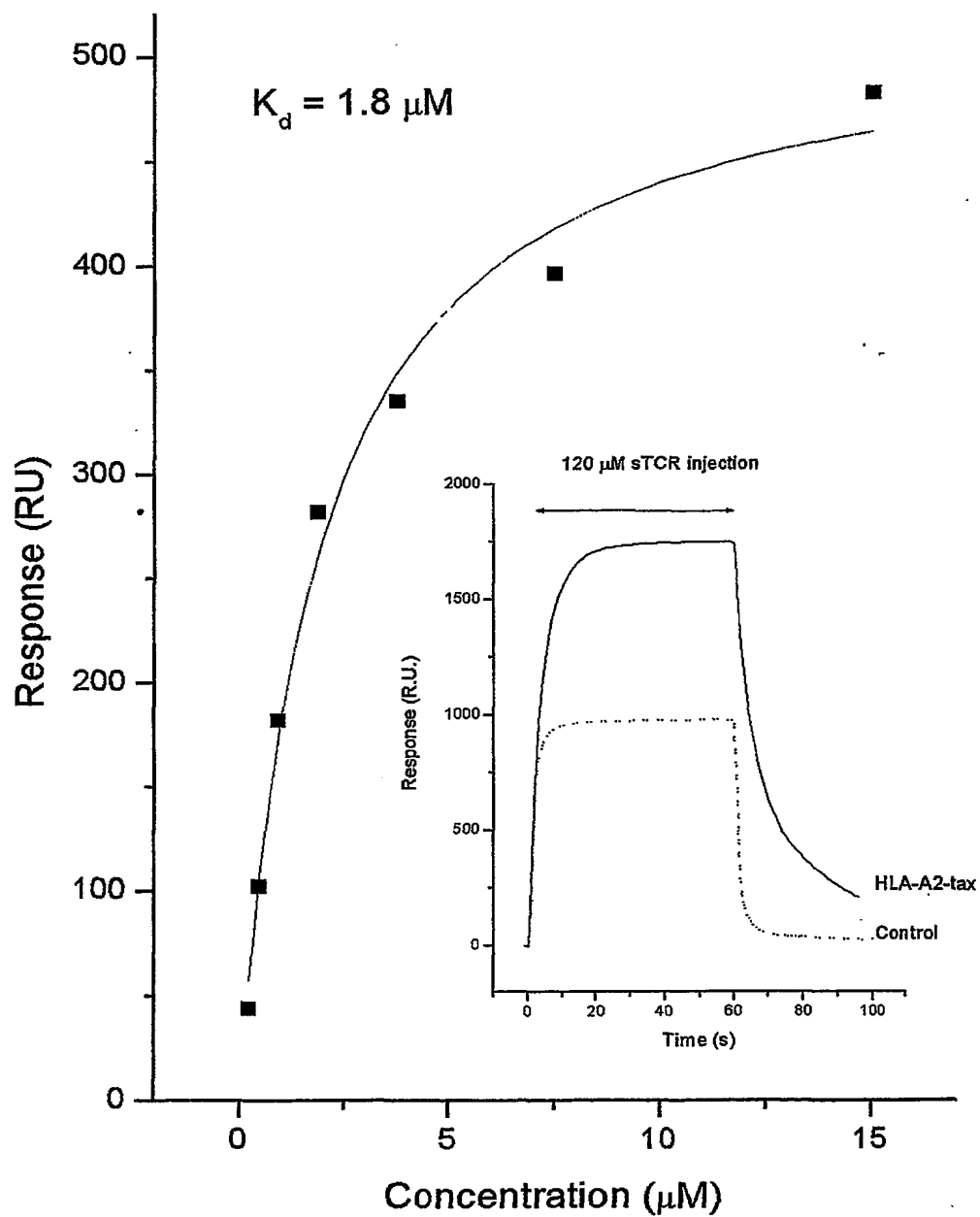
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Figure 6



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Figure 7



**Figure 8a**

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ggggaatttgcagtttggagcagggacccaggttgtggtcaccacagatatccagaac  
ccggaacccctgccgtgtaccagctgagagactctaaatccagtgacaagtctgtctgcc  
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**Figure 8b**

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ccgattttgattctcaaacaatgtgtcacaaagtaaggattctgatgtgtatatcac  
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**Figure 8c**

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gttctacgggctctcggagaatgacgagtggaaccaggatagggccaaacctgtcacc  
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Figure 9a

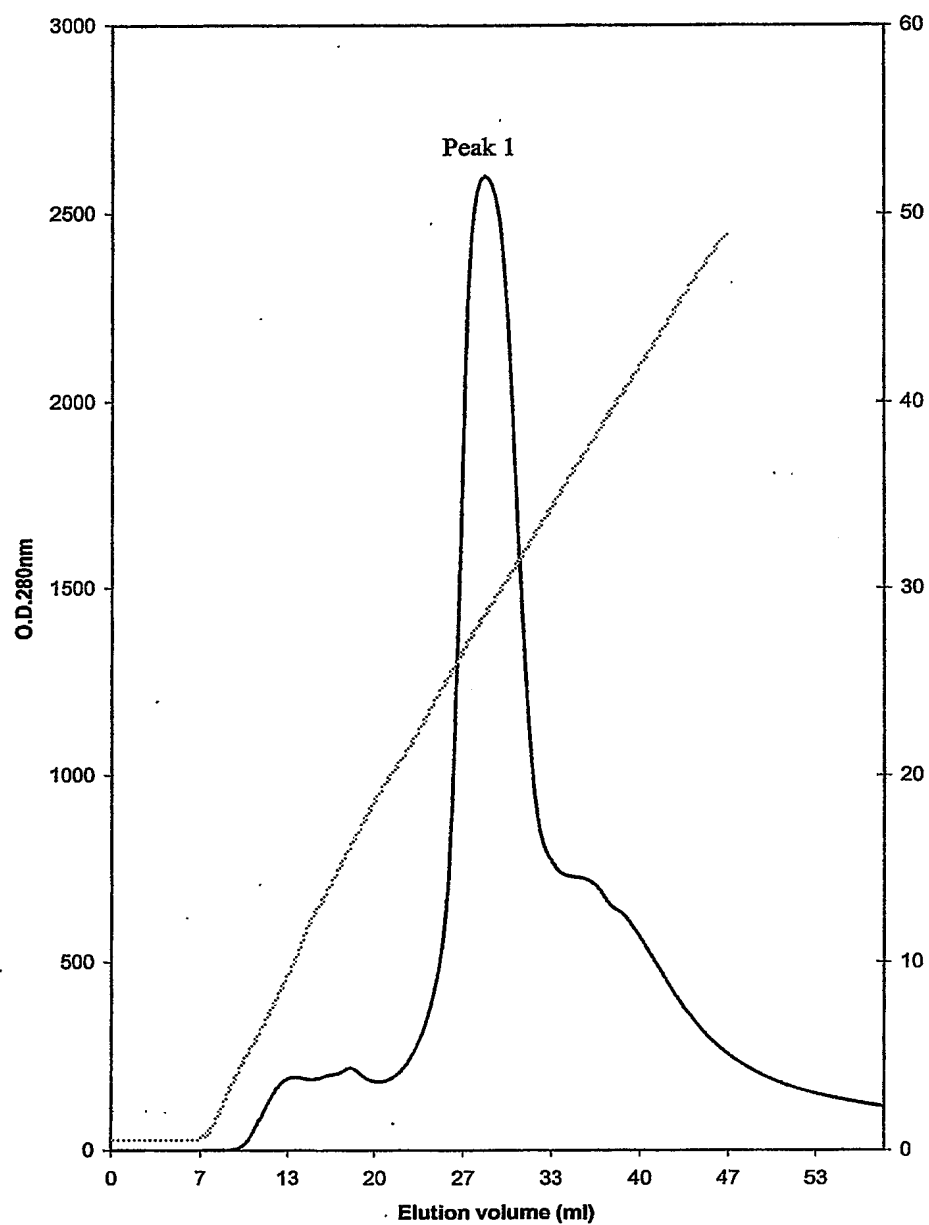
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DPAVYQLRDSKSSDKSVCLFTDFDSQTNVSQSKDSDVY  
ITDKCVLDMRSMDFKSNSAVAWSNKSDFACANAFNNSI  
IPEDTFFPSPESS Stop

Figure 9b

MVDGGITQSPKYLFRKEGQNVTLSC EQNLNHDAMYWY  
RQDPGQGLRLIYYSQIVNDFQKGDIAEGYSVSREKKESF  
PLTVTSAQKNPTAFYLCASSSRSSYEQYFGPGTRLTVTE  
DLKNVFPPEVAVFEPSEAEISHTQKATLVCLATGFYPDH  
VELSWWWNGKEVHSGVCTDPQPLKEQPALNDSRYSLSS  
RLRVSATFWQNPRNHFRCQVQFYGLSENDEWTQDRAK  
PVTQIVSAEAWGRAD Stop

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Figure 10



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Figure 11

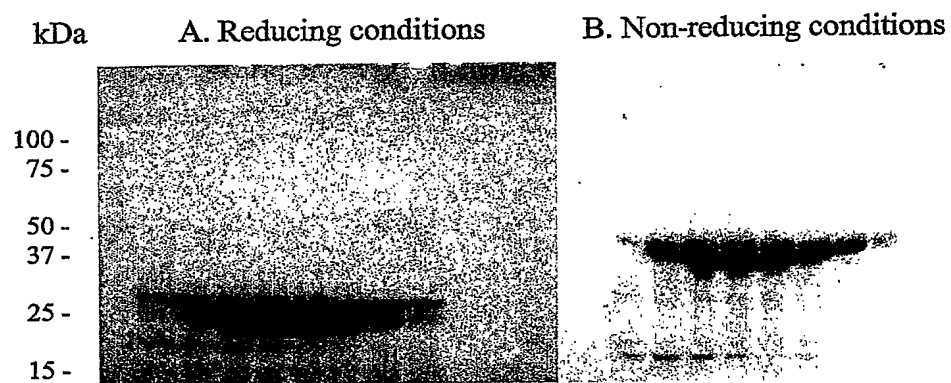
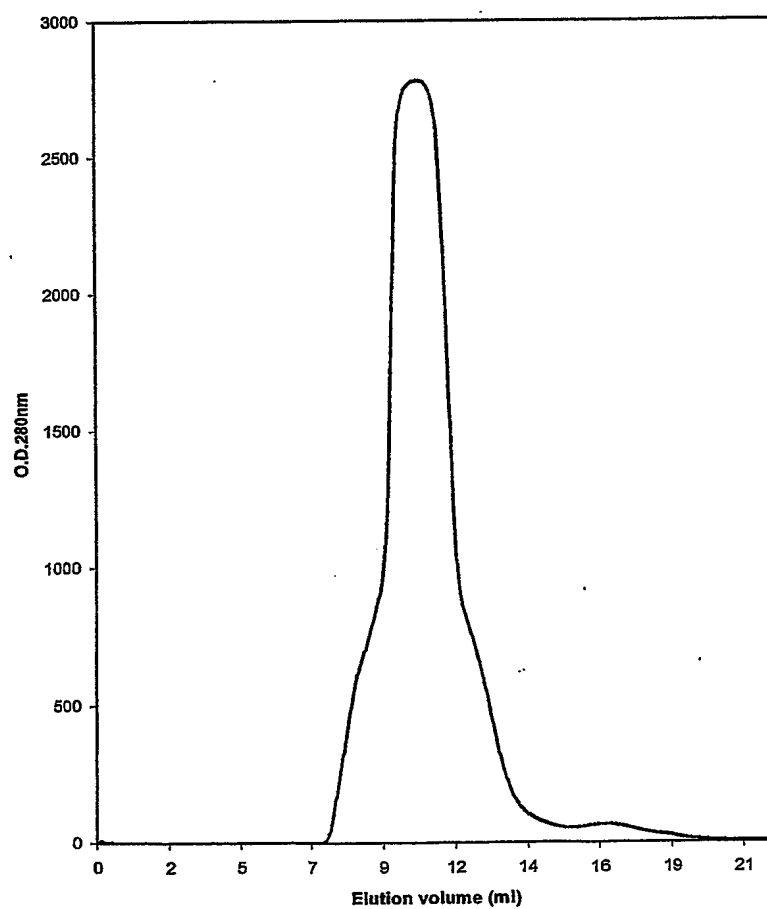


Figure 12



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Figure 13a

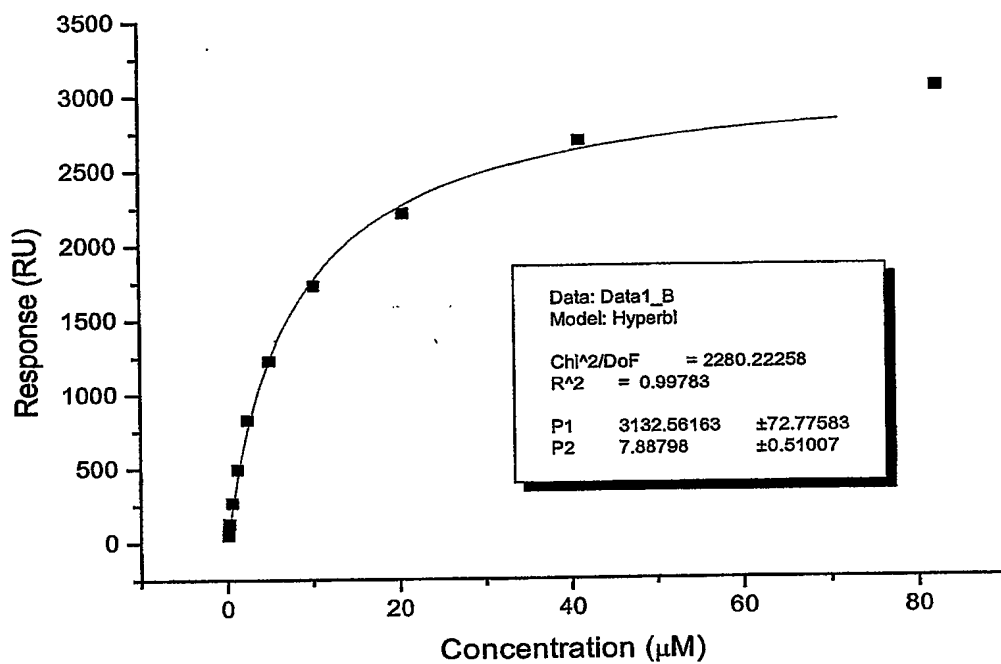
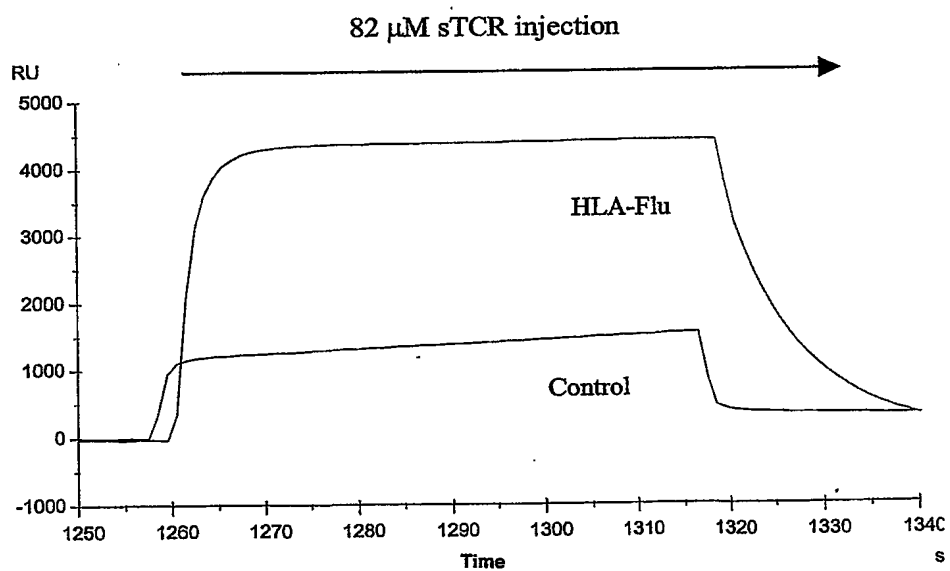


Figure 13b



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**Figure 14a**

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 cagcttctcagcctgggtgactcagccacctacctctgtgctgtgaggcccacatcagg  
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 cagaaccttgacctgcccgtgtaccagctgagagactctaaatccagtgacaagtctg  
 tctgcctattcaccgattttgattctcaaaacaaatgtgtcaciaaagtaaggattctga  
 tgtgtatatcacagacaaatgtgtgctagacatgaggtctatggacttcaagagcaac  
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 gcattattccagaagacaccttcttccccagcccagaaagttcctaa

**Figure 14b**

atgggtgtcactcagacccccaaaattccaggtcctgaagacaggacagagcatgacac  
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**Figure 15a**

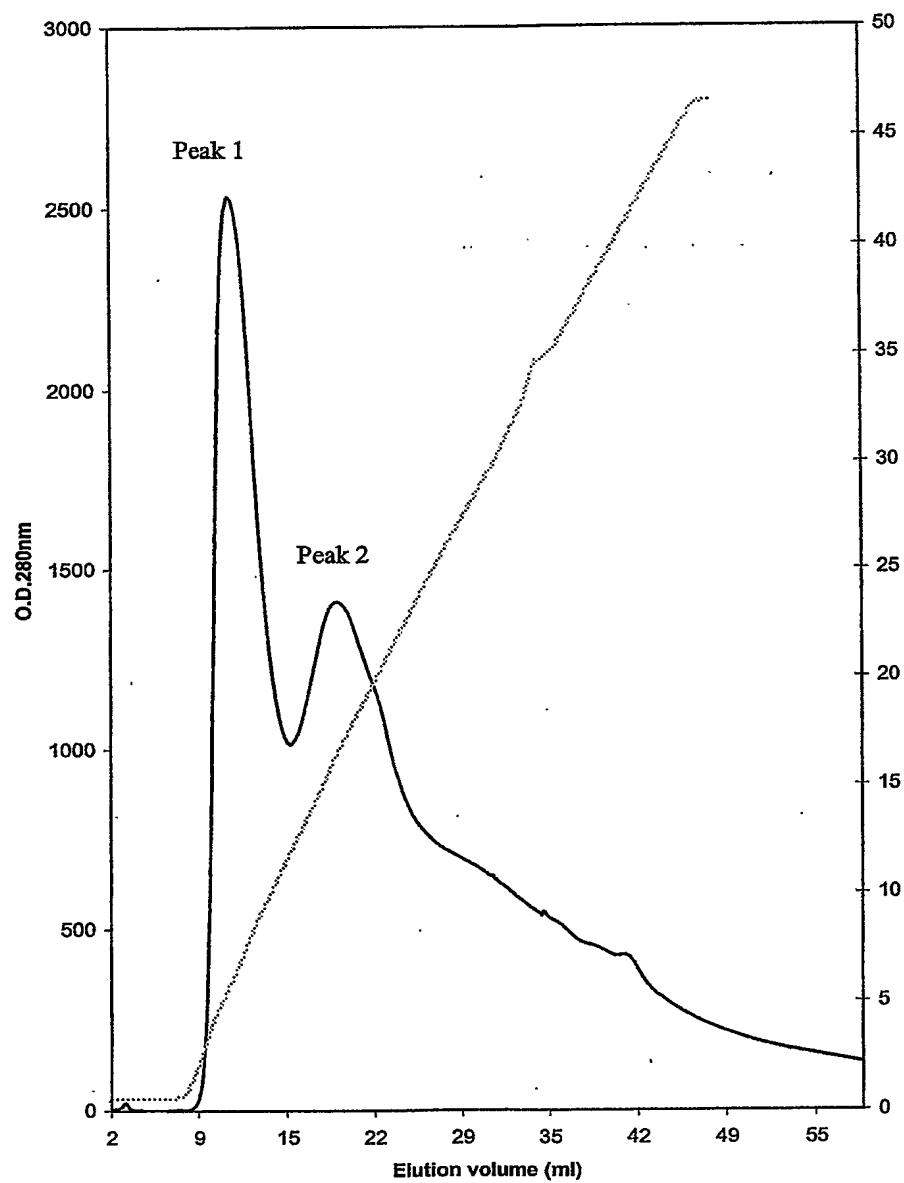
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 AASQPGDSATYLC AVRPTSGGSYIPTFGRGTS LIVHPYI  
 QNPDP AVYQLRDSKSSDKSVCLFTDFDSQTNVSQSKDS  
 DVIYITDKCVLDMRSMDFKSNSAVAWSNKSDFACANAF  
 NNSIIPEDTFFPSPESS Stop

**Figure 15b**

MGVTQTPKFQVLKTGQSM TLQCAQDMNHEYMSWYRQ  
 DPGMetGLRLIHYSVGAGITDQGEVPNGYNVSRSTTEDF  
 PLRLLSAAPSQTSVYFCASSYVGNTGELFFGEGSRLTVL  
 EDLKNVFPPEVAVFEPSEAEISHTQKATLVCLATGFYPD  
 HVELSWVNGKEVHSGVCTDPQPLKEQPALNDSRYAL  
 SSRRLRV SATFWQDPRNHFR CQVQFYGLSENDEWTQDRA  
 KPVTQIVSAEAWGRAD Stop

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Figure 16



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Figure 17

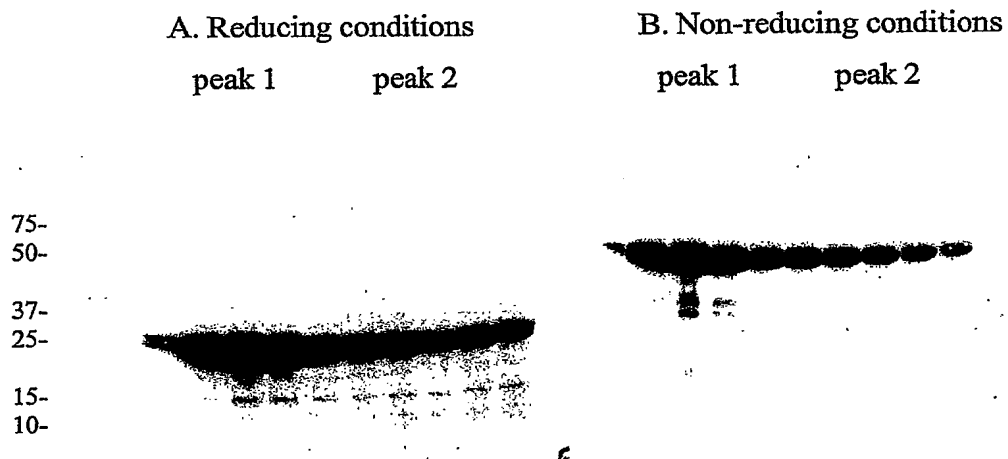
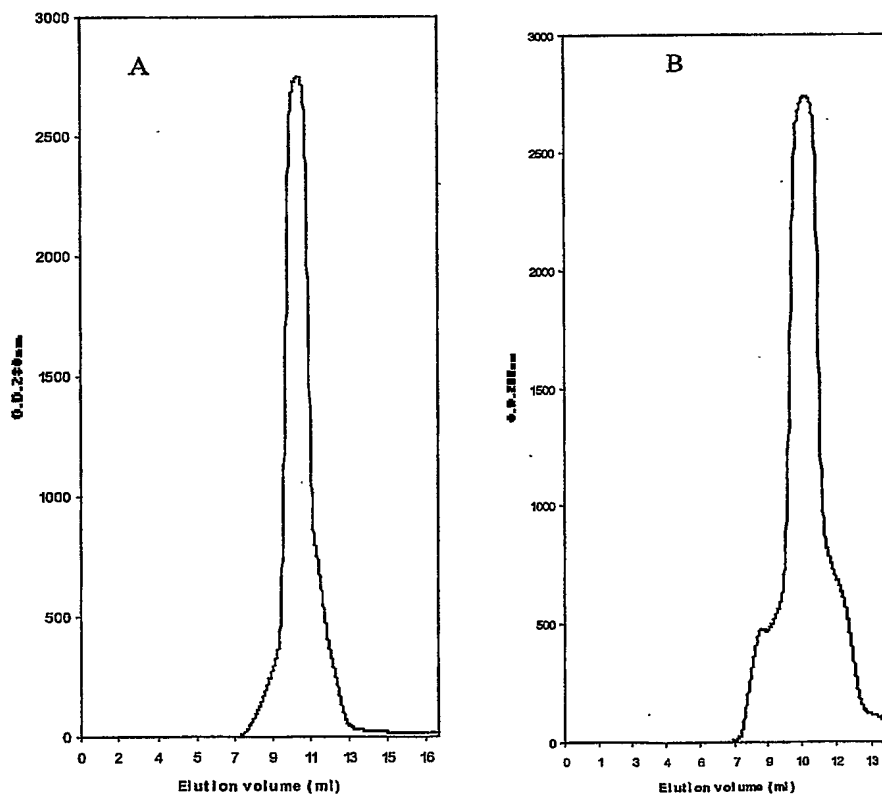


Figure 18



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Figure 19a

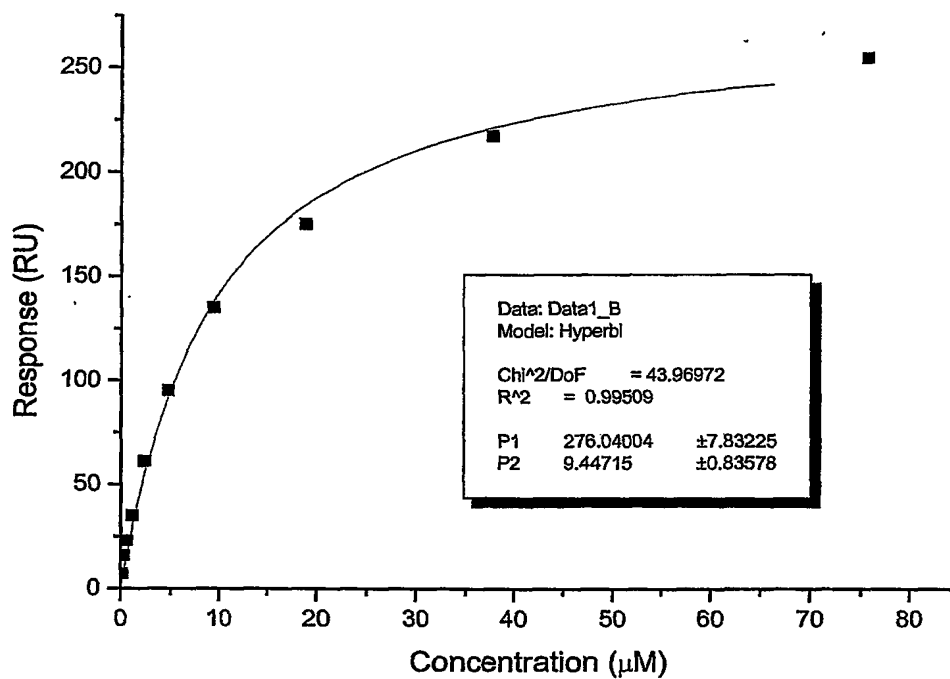


Figure 19b

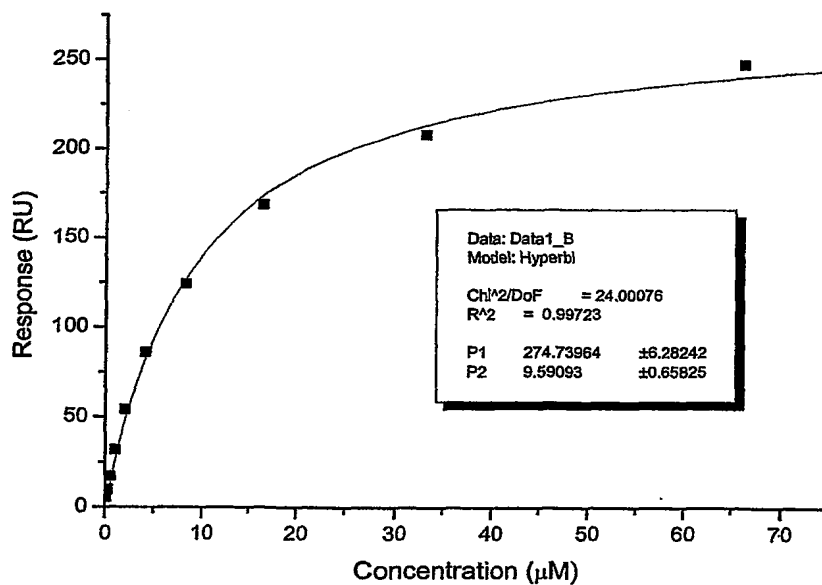




Figure 20a

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Figure 20b

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Figure 21a

MQEXTQIPAALSVPEGENLVLNCSFTDS AIYNLQWFRQ  
DPGKGLTSLLLIQSSQREQTSGRLNASLDKSSGRSTLYI  
AASQPGDSATYLC AVRPTSGGSYIPTFGRGTSLIVHPYI  
QNPDP AVYQLRDSKSSDKSVCLFTDFDSQTNVSQSKDS  
DVYITDKCVLDMRSMDFKSNSA VAWSNKSDFACANAF  
NNSIIPEDTFFPSPSSC Stop

Figure 21b

MGVTQTPKFQVLKTGQSM TLQCAQDMNHEYMSWYRQ  
DPGMGLRLIHYSVGAGITDQGEVPNGYNVSRSTTEDFP  
LRLLSAAPSQTSVYFCASSYVGNTGELFFGEGSRLTVLE  
DLKNVFPPEVA VFEPSEAEISHTQKATLVCLATGFYPDH  
VELSWWWNGKEVHSGVCTDPQPLKEQPALNDSRYALSS  
RLRVSATFWQDPRNHFR CQVQFYGLSENDEWTQDRAK  
PVTQIVSAEAWGRADC Stop

Figure 22

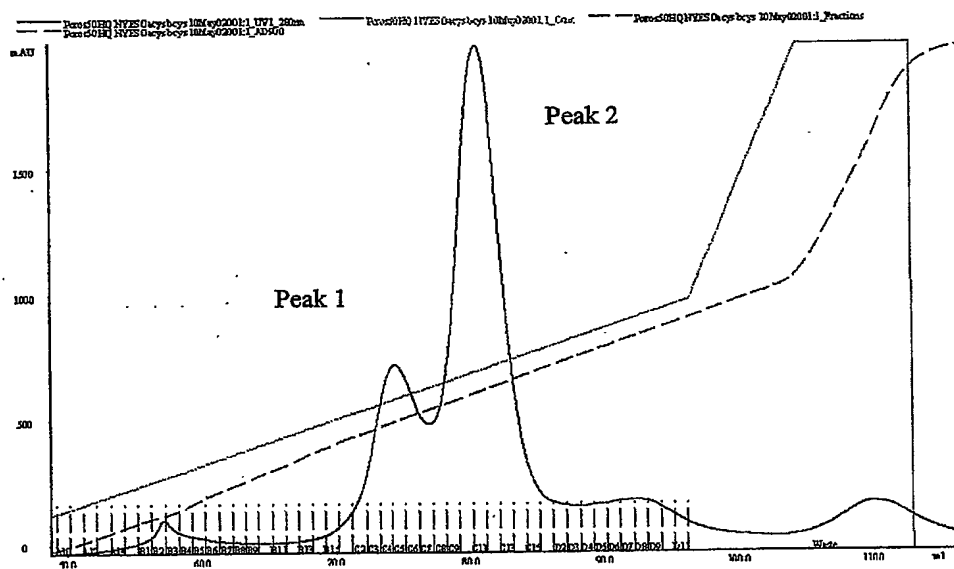
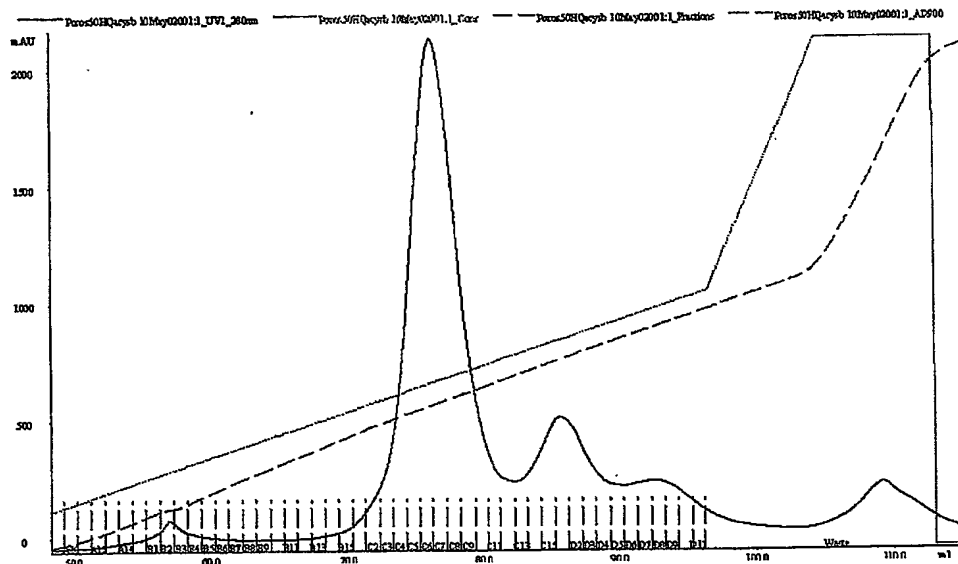
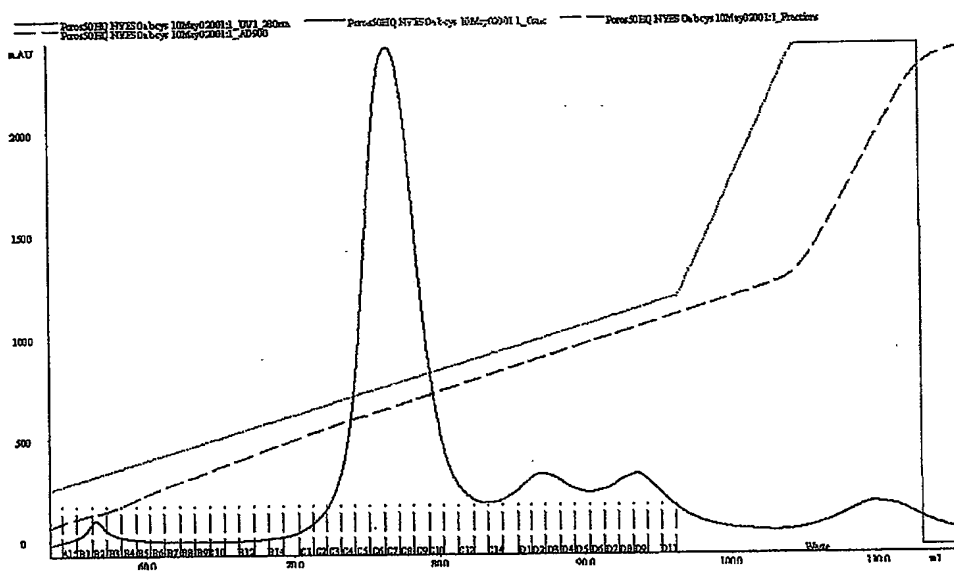


Figure 23



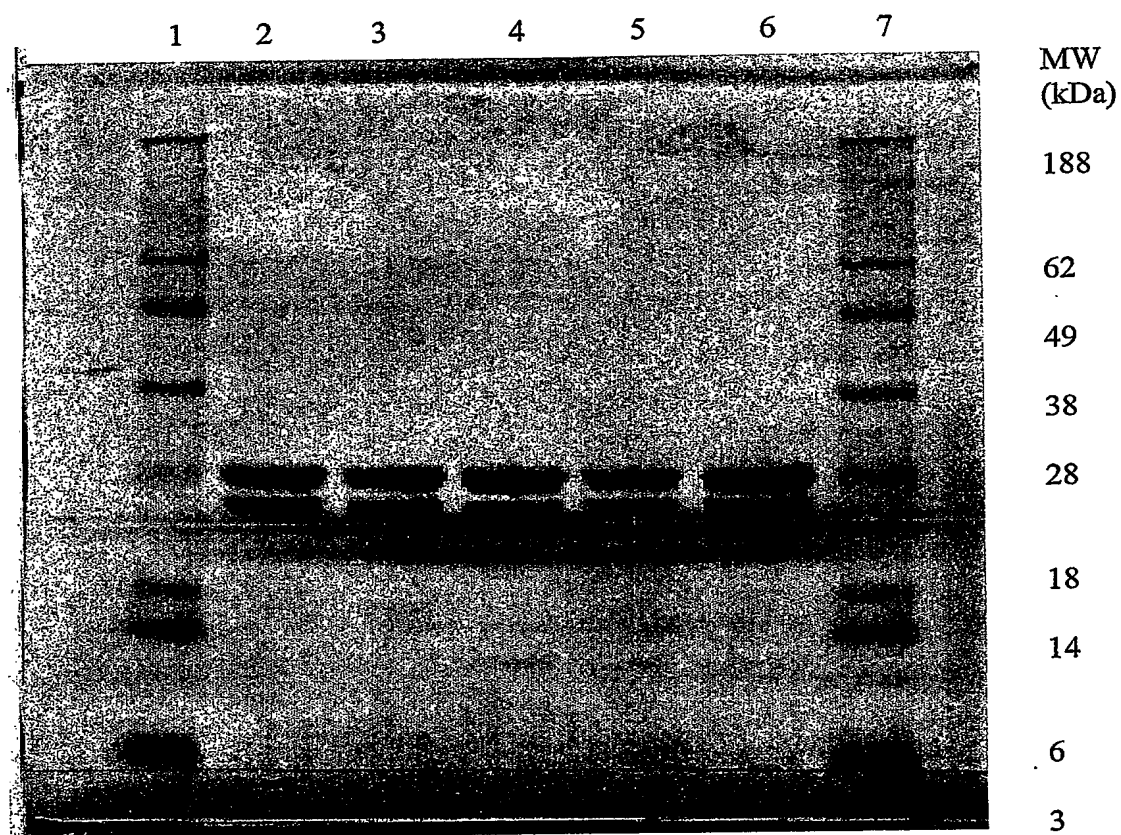
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Figure 24



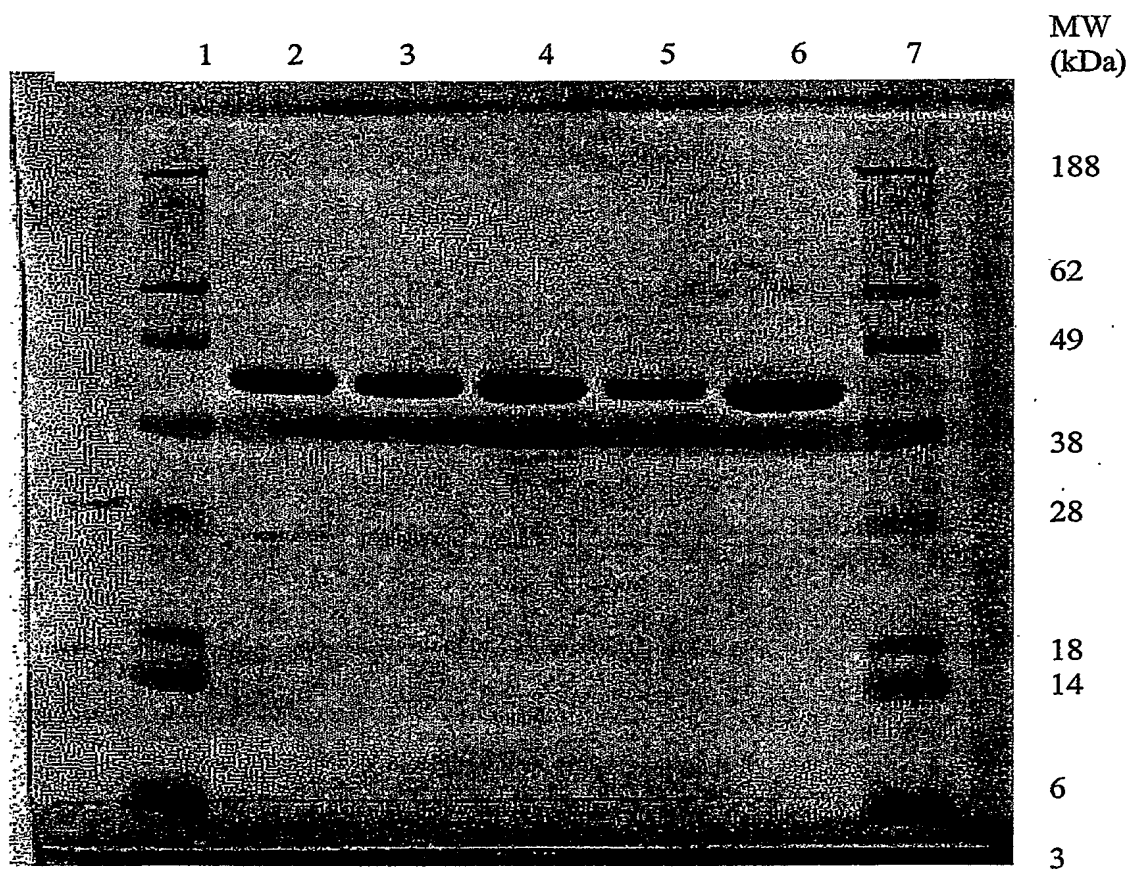
20/81

Figure 25



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Figure 26



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Figure 27

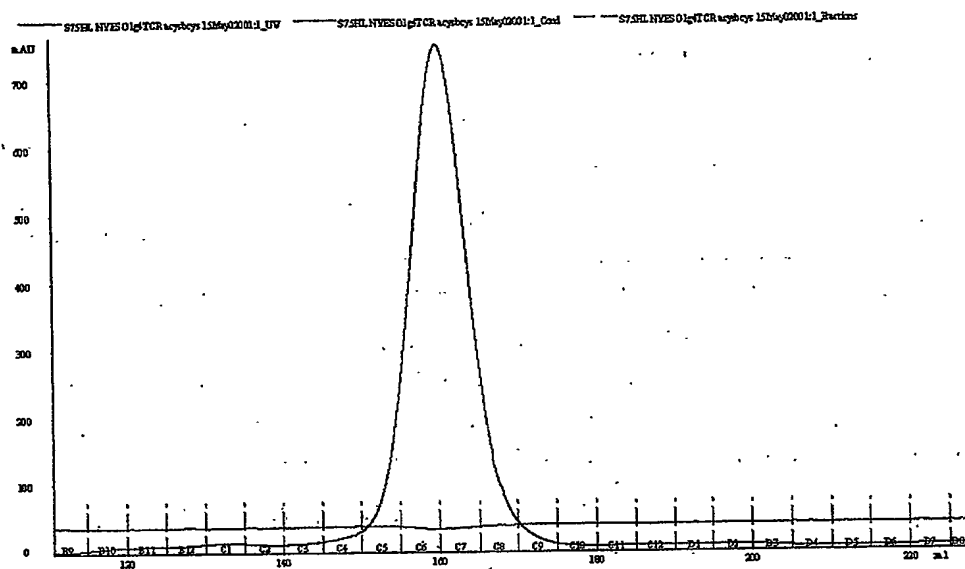
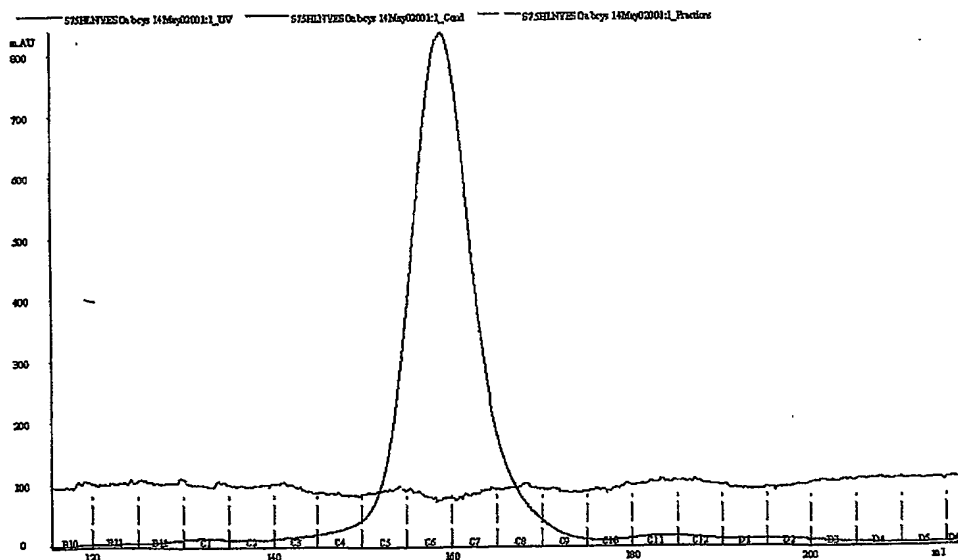
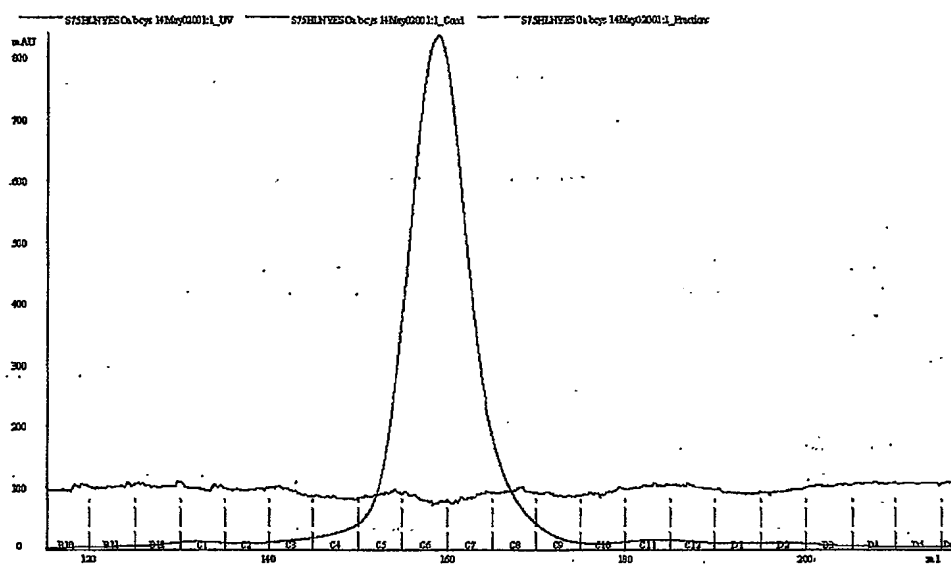


Figure 28



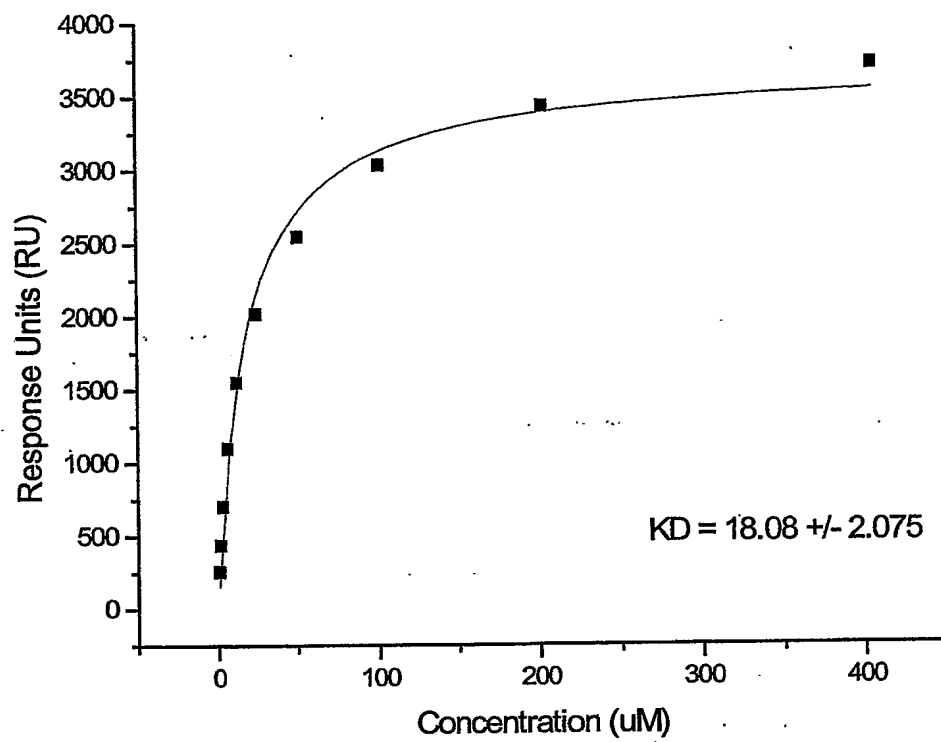
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Figure 29



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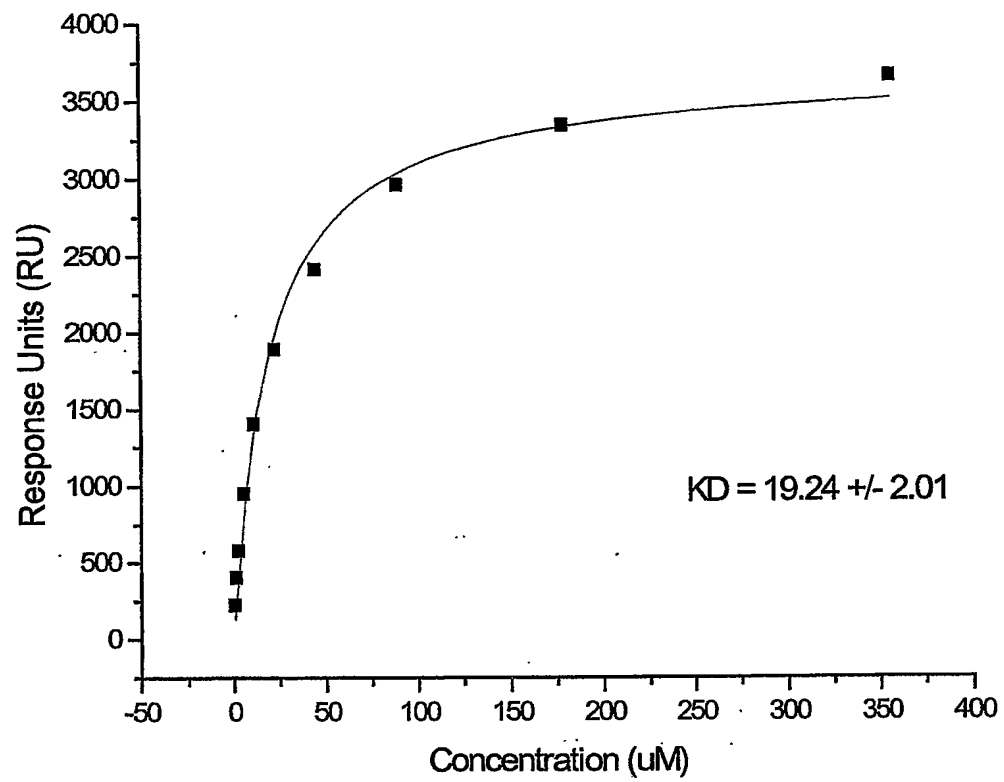
Figure 30





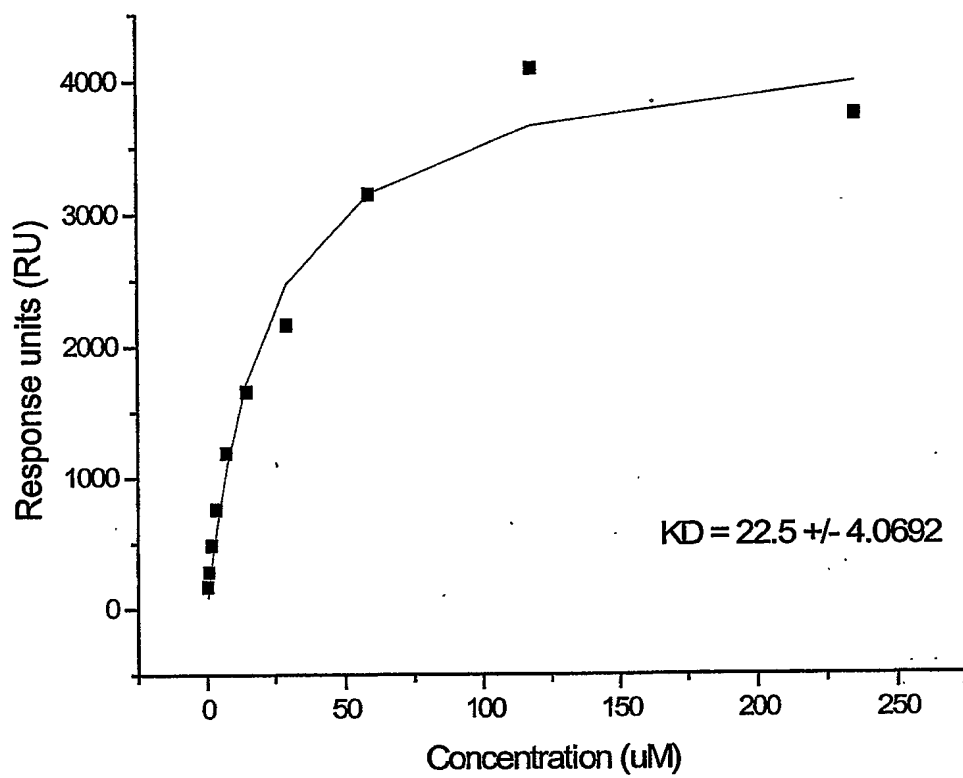
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Figure 31



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Figure 32



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**Figure 33a**

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cagcccagaaagttcctaa

**Figure 33b**

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**Figure 34a**

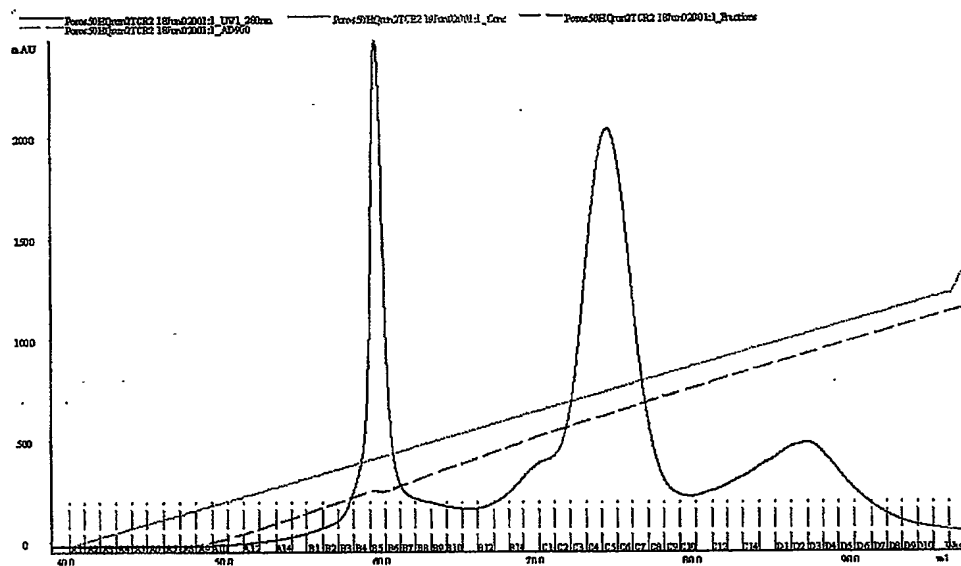
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VYQLRDSKSSDKSVCLFTDFDSQTNVSQSKDSDVYITDKC  
VLDMRSMDFKSNSAVAWSNKSDFACANAFNNSIIPEDTFF  
PSP ESS Stop

**Figure 34b**

MGVMQNPRHLVRRRGQEARLRCSPMKGHSHVYWYRQLP  
EEGLKFMVYLQKENIIDESGMPKERFSAEFPKEGPSILRIQ  
QVVRGDSAAYFCASSPQTGGTDTQYFGPGTRTLTVLEDLKN  
VFPPEVAVFEPSEAEISHTQKATLVCLATGFYPDHVELSW  
WVNGKEVHSGVCTDPQPLKEQPALNDSRYALSSRLRVSAT  
FWQDPRNHFRCQVQFYGLSENDEWTQDRAKPVTQIVSAE  
AWGRAD Stop

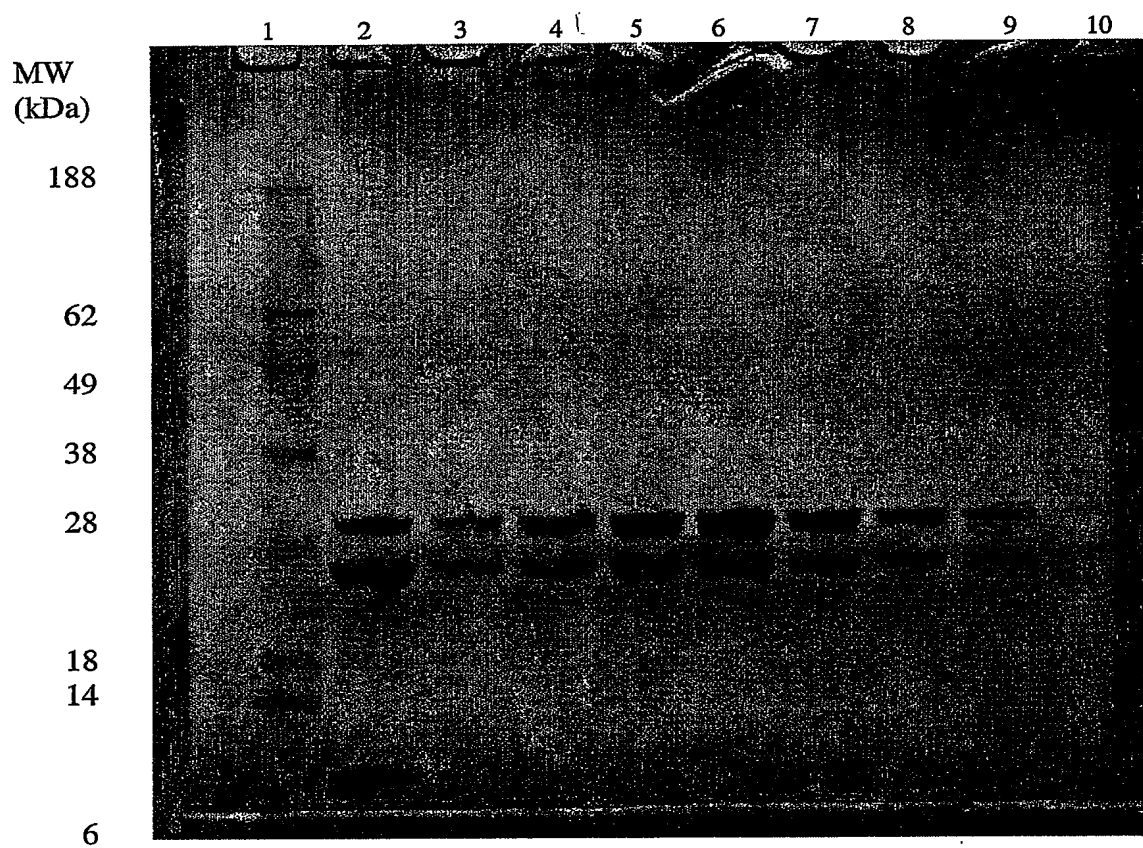
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Figure 35



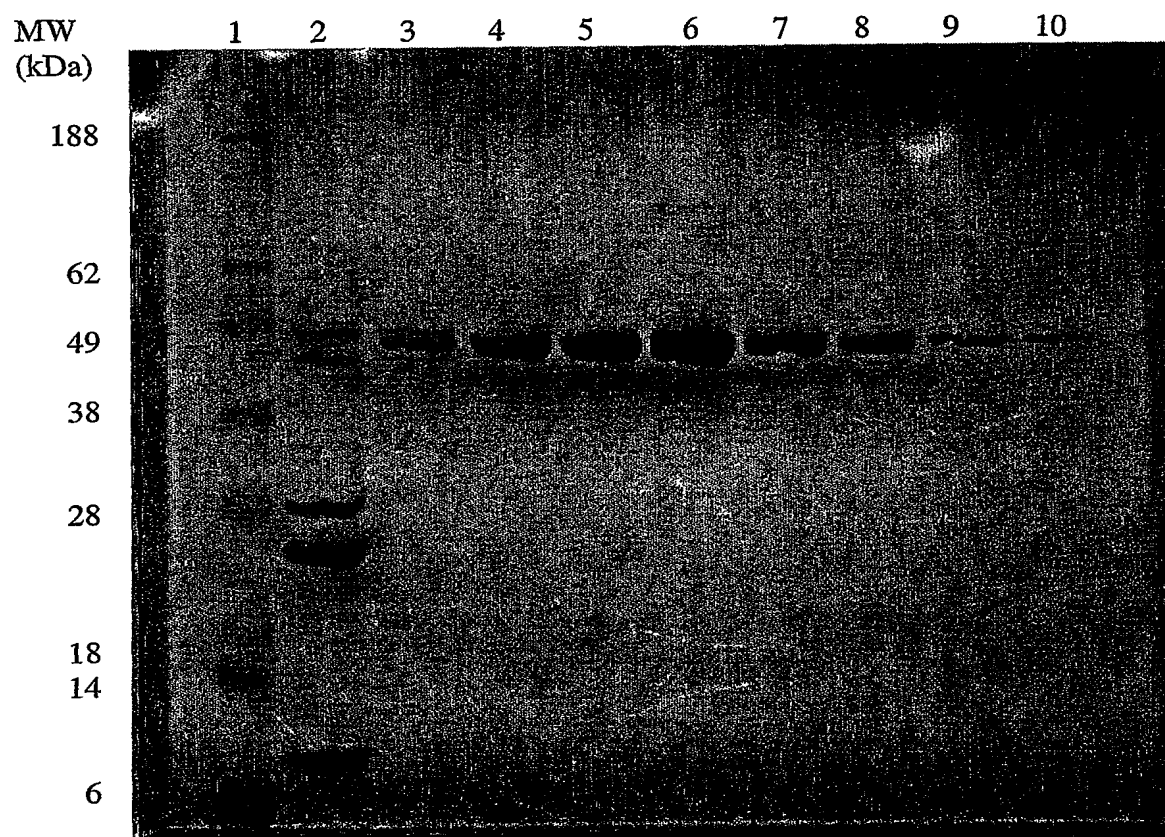
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Figure 36



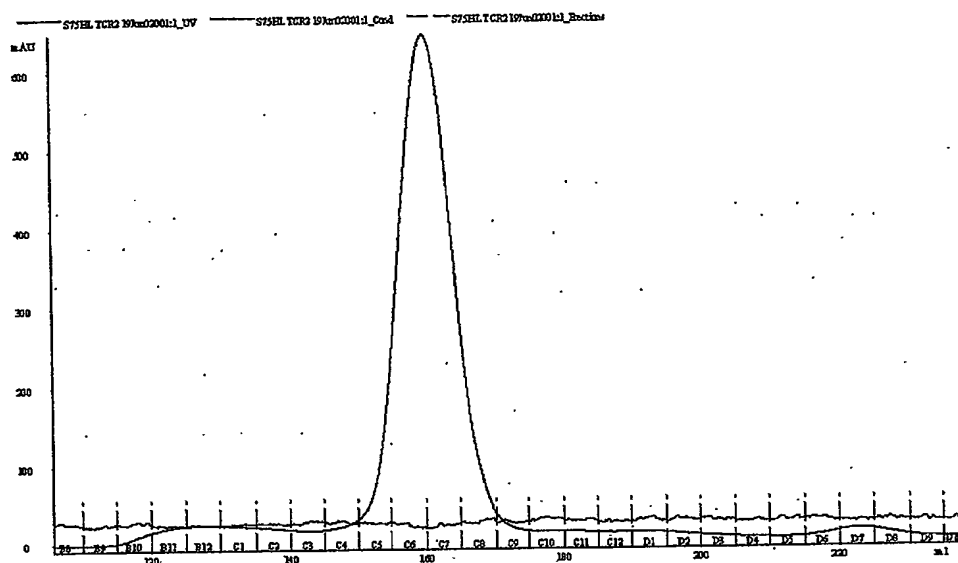
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Figure 37



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Figure 38



**Figure 39a – T48→C  $\alpha$  chain**

atgcagaaggaagtggagcagaactctggacccctcagtggtccagagggagcca  
 ttgcctctctcaactgcacttacagtgaccgaggttcccagtccttcttctggta  
 cagacaatatcttggaagccctgagttgataatgtccatatactccaatggg  
 gacaaagaagatggaaggtttacagcacagctcaataaagccagccagtatgttt  
 ctctgctcatcagagactcccagcccagtgattcagccacctacctctgtgccgt  
 tacaactgacagctgggggaaattgcagtttgagcagggaccaggttgtggtc  
 accccagatatccagaaccctgaccctgccgtgtaccagctgagagactctaaat  
 ccagtgacaagtctgtctgcctattcaccgattttgattctcaaacaatgtgtc  
 acaaagtaaggattctgatgtgtatatcacagacaaa[box]gtgctagacatgagg  
 tctatggacttcaagagcaacagtgctgtggcctggagcaacaatctgactttg  
 catgtgcaaacgccttcaacaacagcattattccagaagacaccttcttcccag  
 cccagaaagttcctaa

**Figure 39b – T48→C  $\alpha$  chain**

MQ

K<sub>1</sub>EVEQNSGPL SVPEGAIASL NCTYSDRGSQ SFFWYRQYSG KSPELIMSIY SNGDKEDGRF  
 TAQLNKASQY VSLIIRDSQP SDSATYLCAV TTDSWGKLQF GAGTQVVVTP DIQNPDPVAVY  
 QLRDSKSSDK SVCLFTDFDS QTNVSQSKDS DVYITDKCVL DMRSMDFKSN SAVAWSNKSD  
 FACANAFNNS IIPEDTEFFPS PESS\*

**Figure 40a – T45→C alpha chain DNA Sequence**

Atgcagaaggaagtggagcagaactctggacccctcagtggtccagagggagcca  
 ttgcctctctcaactgcacttacagtgaccgaggttcccagtccttcttctggta  
 cagacaatatcttggaagccctgagttgataatgtccatatactccaatggg  
 gacaaagaagatggaaggtttacagcacagctcaataaagccagccagtatgttt  
 ctctgctcatcagagactcccagcccagtgattcagccacctacctctgtgccgt  
 tacaactgacagctgggggaaattgcagtttgagcagggaccaggttgtggtc  
 accccagatatccagaaccctgaccctgccgtgtaccagctgagagactctaaat  
 ccagtgacaagtctgtctgcctattcaccgattttgattctcaaacaatgtgtc  
 acaaagtaaggattctgatgtgtatatc[box]gacaaaactgtgctagacatgagg  
 tctatggacttcaagagcaacagtgctgtggcctggagcaacaatctgactttg  
 catgtgcaaacgccttcaacaacagcattattccagaagacaccttcttcccag  
 cccagaaagttcctaa

**Figure 40b – T45→C alpha chain Amino Acid Sequence**

MQ

K<sub>1</sub>EVEQNSGPL SVPEGAIASL NCTYSDRGSQ SFFWYRQYSG KSPELIMSIY SNGDKEDGRF  
 TAQLNKASQY VSLIIRDSQP SDSATYLCAV TTDSWGKLQF GAGTQVVVTP DIQNPDPVAVY  
 QLRDSKSSDK SVCLFTDFDS QTNVSQSKDS DVYICDKTVL DMRSMDFKSN SAVAWSNKSD  
 FACANAFNNS IIPEDTEFFPS PESS\*



**Figure 41a – S61→C alpha chain DNA Sequence**

Atgcagaaggaagtggagcagaactctggacccctcagtgttccagagggagcca  
 ttgcctctctcaactgcacttacagtgaccgaggttcccagtccttcttctggta  
 cagacaatatctctgggaaaagccctgagttgataatgtccatatactccaatggg  
 gacaaagaagatggaaggtttacagcacagctcaataaagccagccagtatgttt  
 ctctgctcatcagagactcccagcccagtgattcagccacctacctctgtgccgt  
 tacaactgacagctgggggaaattgcagtttggagcagggacccaggttgtggtc  
 accccagatatccagaaccctgaccctgccgtgtaccagctgagagactctaaat  
 ccagtgacaagtctgtctgcctattcaccgattttgattctcaaacaaatgtgtc  
 acaaagtaaggattctgatgtgtatatcacagacaaaactgtgctagacatgagg  
 tctatggacttcaagagcaac[REDACTED]gctgtggcctggagcaacaaatctgactttg  
 catgtgcaaacgccttcaacaacagcattattccagaagacaccttcttccccag  
 cccagaaagttcctaa

**Figure 41b – S61→C alpha chain Amino Acid Sequence**

MQ  
 K<sub>1</sub>EVEQNSGPL SVPEGAIASL NCTYSDRGSQ SFFWYRQYSG KSPELIMSIY  
 SNGDKEDGRF TAQLNKASQY VLLIRDSQP SDSATYLCAV TTDSWGKLQF  
 GAGTQVVVTP DIQNPDPVAV QLRDSKSSDK SVCLFTDFDS QTNVSQSKDS  
 DVYITDKTVL DMRSMDFKSN CAVAWSNKSD FACANAFNNS IIPEDTFFPS PESS\*

**Figure 42a – L50→C alpha chain DNA Sequence**

Atgcagaaggaagtggagcagaactctggacccctcagtgttccagagggagcca  
 ttgcctctctcaactgcacttacagtgaccgaggttcccagtccttcttctggta  
 cagacaatatctctgggaaaagccctgagttgataatgtccatatactccaatggg  
 gacaaagaagatggaaggtttacagcacagctcaataaagccagccagtatgttt  
 ctctgctcatcagagactcccagcccagtgattcagccacctacctctgtgccgt  
 tacaactgacagctgggggaaattgcagtttggagcagggacccaggttgtggtc  
 accccagatatccagaaccctgaccctgccgtgtaccagctgagagactctaaat  
 ccagtgacaagtctgtctgcctattcaccgattttgattctcaaacaaatgtgtc  
 acaaagtaaggattctgatgtgtatatcacagacaaaactgtg[REDACTED]gacatgagg  
 tctatggacttcaagagcaacagtgctgtggcctggagcaacaaatctgactttg  
 catgtgcaaacgccttcaacaacagcattattccagaagacaccttcttccccag  
 cccagaaagttcctaa

**Figure 42b – L50→C alpha chain Amino Acid Sequence**

MQ  
 K<sub>1</sub>EVEQNSGPL SVPEGAIASL NCTYSDRGSQ SFFWYRQYSG KSPELIMSIY  
 SNGDKEDGRF TAQLNKASQY VLLIRDSQP SDSATYLCAV TTDSWGKLQF  
 GAGTQVVVTP DIQNPDPVAV QLRDSKSSDK SVCLFTDFDS QTNVSQSKDS  
 DVYITDKTVL DMRSMDFKSN SAVAWSNKSD FACANAFNNS IIPEDTFFPS PESS\*

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**Figure 43a – Y10→C α chain**

atgcagaaggaagtggagcagaactctggacccctcagtgttccagagggagcca  
ttgcctctctcaactgcacttacagtgaccgaggttcccagtccttcttctggta  
cagacaatatctctgggaaaagccctgagttgataatgtccatatactccaatggt  
gacaaagaagatggaaggtttacagcacagctcaataaagccagccagtatgttt  
ctctgctcatcagagactcccagcccagtgattcagccacctacctctgtgccgt  
tacaactgacagctgggggaaattgcagtttggagcagggacccaggttgtggtc  
accccagatatccagaaccctgaccctgccgtgagctgagagactctaaat  
ccagtgacaagtctgtctgcctattcaccgattttgattctcaaacaaatgtgtc  
acaaagtaaggattctgatgtgtatatcacagacaaaactgtgctagacatgagg  
tctatggacttcaagagcaacagtgctgtggcctggagcaacaaatctgactttg  
catgtgcaaacgccttcaacaacagcattattccagaagacaccttcttccccag  
cccagaaagttcctaa

**Figure 43b – Y10→C α chain**

MQ

K<sub>1</sub>EVEQNSGPL SVPEGAIASL NCTYSDRGSQ SFFWYRQYSG KSPELIMSIY  
SNGDKEDGRF TAQLNKASQY VLLIRDSQP SDSATYLCAV TTDSWGKLQF  
GAGTQVVVTP DIQNPDPAVC QLRDSKSSDK SVCLFTDFDS QTNVSQSKDS  
DVYITDKTVL DMRSMDFKSN SAVAWSNKSD FACANAFNNS IIPEDTFFPS PESS\*

**Figure 44a – S15→C α chain**

atgcagaaggaagtggagcagaactctggacccctcagtgttccagagggagcca  
ttgcctctctcaactgcacttacagtgaccgaggttcccagtccttcttctggta  
cagacaatatctctgggaaaagccctgagttgataatgtccatatactccaatggt  
gacaaagaagatggaaggtttacagcacagctcaataaagccagccagtatgttt  
ctctgctcatcagagactcccagcccagtgattcagccacctacctctgtgccgt  
tacaactgacagctgggggaaattgcagtttggagcagggacccaggttgtggtc  
accccagatatccagaaccctgaccctgccgtgtaccagctgagagactctaaat  
ccagtgacaagtctgtctgcctattcaccgattttgattctcaaacaaatgtgtc  
acaaagtaaggattctgatgtgtatatcacagacaaaactgtgctagacatgagg  
tctatggacttcaagagcaacagtgctgtggcctggagcaacaaatctgactttg  
catgtgcaaacgccttcaacaacagcattattccagaagacaccttcttccccag  
cccagaaagttcctaa

**Figure 44b – S15→C α chain**

MQ

K<sub>1</sub>EVEQNSGPL SVPEGAIASL NCTYSDRGSQ SFFWYRQYSG KSPELIMSIY  
SNGDKEDGRF TAQLNKASQY VLLIRDSQP SDSATYLCAV TTDSWGKLQF  
GAGTQVVVTP DIQNPDPAVY QLRDCKSSDK SVCLFTDFDS QTNVSQSKDS  
DVYITDKTVL DMRSMDFKSN SAVAWSNKSD FACANAFNNS IIPEDTFFPS PESS\*

**Figure 45a – L12→C  $\alpha$  chain**

atgcagaaggaagtggagcagaactctggacccctcagtgttccagagggagcca  
ttgcctctctcaactgcacttacagtgaccgaggttcccagtccttcttctggta  
cagacaatatctctgggaaaagccctgagttgataatgtccatatactccaatggg  
gacaaagaagatggaaggtttacagcacagctcaataaagccagccagtatgttt  
ctctgctcatcagagactcccagcccagtgattcagccacctacctctgtgccgt  
tacaactgacagctgggggaaattgcagtttggagcagggacccaggttgtggtc  
accccagatatccagaaccctgaccctgccgtgtaccagcagagactctaaat  
ccagtgacaagtctgtctgcctattcaccgattttgattctcaaacaatgtgtc  
acaaagtaaggattctgatgtgtatatcacagacaaaactgtgctagacatgagg  
tctatggacttcaagagcaacagtgctgtggcctggagcaacaaatctgactttg  
catgtgcaaacgccttcaacaacagcattattccagaagacaccttcttccccag  
cccagaaagttcctaa

**Figure 45b – L12→C  $\alpha$  chain**

MQ

K<sub>1</sub>EVEQNSGPL SVPEGAIASL NCTYSDRGSQ SFFWYRQYSG KSPELIMSIY  
SNGDKEDGRF TAQLNKASQY VLLIRDSQP SDSATYLCAV TTDSWGKLQF  
GAGTQVVVTP DIQNPDPAVY QCRDSKSSDK SVCLFTDFDS QTNVSQSKDS  
DVYITDKTVL DMRSMDFKSN SAVAWSNKSD FACANAFNNS IIPEDTFFPS PESS\*

**Figure 46a – V22→C  $\alpha$  chain**

atgcagaaggaagtggagcagaactctggacccctcagtgttccagagggagcca  
ttgcctctctcaactgcacttacagtgaccgaggttcccagtccttcttctggta  
cagacaatatctctgggaaaagccctgagttgataatgtccatatactccaatggg  
gacaaagaagatggaaggtttacagcacagctcaataaagccagccagtatgttt  
ctctgctcatcagagactcccagcccagtgattcagccacctacctctgtgccgt  
tacaactgacagctgggggaaattgcagtttggagcagggacccaggttgtggtc  
accccagatatccagaaccctgaccctgccgtgtaccagctgagagactctaaat  
ccagtgacaagtctgcctattcaccgattttgattctcaaacaatgtgtc  
acaaagtaaggattctgatgtgtatatcacagacaaaactgtgctagacatgagg  
tctatggacttcaagagcaacagtgctgtggcctggagcaacaaatctgactttg  
catgtgcaaacgccttcaacaacagcattattccagaagacaccttcttccccag  
cccagaaagttcctaa

**Figure 46b – V22→C  $\alpha$  chain**

MQ

K<sub>1</sub>EVEQNSGPL SVPEGAIASL NCTYSDRGSQ SFFWYRQYSG KSPELIMSIY  
SNGDKEDGRF TAQLNKASQY VLLIRDSQP SDSATYLCAV TTDSWGKLQF  
GAGTQVVVTP DIQNPDPAVY QLRDSKSSDK SCCLFTDFDS QTNVSQSKDS  
DVYITDKTVL DMRSMDFKSN SAVAWSNKSD FACANAFNNS IIPEDTFFPS PESS\*

**Figure 47a – M52→C α chain**

atgcagaaggaagtggagcagaactctggacccctcagtgttccagagggagcca  
 ttgcctctctcaactgcacttacagtgaccgaggttcccagtccttcttctggta  
 cagacaatatctctgggaaaagccctgagttgataatgtccatatactccaatggg  
 gacaaagaagatggaaggtttacagcacagctcaataaagccagccagtatgttt  
 ctctgctcatcagagactcccagcccagtgattcagccacctacctctgtgccgt  
 tacaactgacagctgggggaaattgcagtttggagcagggacccaggttgtggtc  
 accccagatatccagaaccctgaccctgccgtgtaccagctgagagactctaaat  
 ccagtgacaagtctgtctgcctattcaccgattttgattctcaaacaatgtgtc  
 acaaagtaaggattctgatgtgtatatcacagacaaaactgtgctagacaggtgagg  
 tctatggacttcaagagcaacagtgctgtggcctggagcaacaaatctgactttg  
 catgtgcaaacgccttcaacaacagcattattccagaagacaccttcttccccag  
 cccagaaagttcctaa

**Figure 47b – M52→C α chain**

MQ

K<sub>1</sub>EVEQNSGPL SVPEGAIASL NCTYSDRGSQ SFFWYRQYSG KSPELIMSIY  
 SNGDKEDGRF TAQLNKASQY VSLLRDSQP SDSATYLCAV TTDSWGKLQF  
 GAGTQVVVTP DIQNPDPAVY QLRDSKSSDK SVCLFTDFDS QTNVSQSKDS  
 DVIITDKTVL DCRSMDFKSN SAVAWSNKSD FACANAFNNS IIPEDTFFPS PESS\*

**Figure 48a – Y43→C α chain**

atgcagaaggaagtggagcagaactctggacccctcagtgttccagagggagcca  
 ttgcctctctcaactgcacttacagtgaccgaggttcccagtccttcttctggta  
 cagacaatatctctgggaaaagccctgagttgataatgtccatatactccaatggg  
 gacaaagaagatggaaggtttacagcacagctcaataaagccagccagtatgttt  
 ctctgctcatcagagactcccagcccagtgattcagccacctacctctgtgccgt  
 tacaactgacagctgggggaaattgcagtttggagcagggacccaggttgtggtc  
 accccagatatccagaaccctgaccctgccgtgtaccagctgagagactctaaat  
 ccagtgacaagtctgtctgcctattcaccgattttgattctcaaacaatgtgtc  
 acaaagtaaggattctgatgtgtatatcacagacaaaactgtgctagacatgagg  
 tctatggacttcaagagcaacagtgctgtggcctggagcaacaaatctgactttg  
 catgtgcaaacgccttcaacaacagcattattccagaagacaccttcttccccag  
 cccagaaagttcctaa

**Figure 48b – Y43→C α chain**

MQ

K<sub>1</sub>EVEQNSGPL SVPEGAIASL NCTYSDRGSQ SFFWYRQYSG KSPELIMSIY  
 SNGDKEDGRF TAQLNKASQY VSLLRDSQP SDSATYLCAV TTDSWGKLQF  
 GAGTQVVVTP DIQNPDPAVY QLRDSKSSDK SVCLFTDFDS QTNVSQSKDS

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**Figure 49a – Ser57→C  $\beta$  chain**

atgaacgctggtgtcactcagacccccaaaattccaggtcctgaagacaggacaga  
gcatgacactgcagtggtgccaggatataaaccatgaatacatgtcctggtatcg  
acaagaccagggcatggggctgaggctgattcattactcagttggtgctggtatc  
actgaccaaggagaagtcccaatggctacaatgtctccagatcaaccacagagg  
atttcccgtcagggctgctgtcggtgctcctcccagacatctgtgtacttctg  
tgccagcaggccgggactagcgggagggcgaccagagcagtaacttcgggcccgggc  
accaggctcacgggtcacagaggacctgaaaaacgtgttcccacccgaggtcgctg  
tgtttgagccatcagaagcagagatctcccacacccaaaaggccacactggtgtg  
cctggccacaggcttctaccccgaccacgtggagctgagctggtgggtgaatggg  
aaggaggtgcacagtgggggtcagacagaccgcagccccctcaaggagcagcccg  
ccctcaatgactccagatacgctctgagcagccgcctgaggggtctcggccacctt  
ctggcaggacccccgcaaccacttccgctgtcaagtccagttctacgggctctcg  
gagaatgacgagtggaaccaggatagggccaaaccgtcaccagatcgtcagcg  
ccgaggcctggggtagagcagactaa

**Figure 49b Ser57→C  $\beta$  chain**

M

N<sub>1</sub>AGVTQTPKF QVLKTGQSMT LQCAQDMNHE YMSWYRQDPG MGLRLIHYSV  
GAGITDQGEV PNGYNVSRST TEDFPLRLLS AAPSQTSVYF CASRPGLAGG  
RPEQYFGPGT RLTVTEDLKN VFPPEVAVFE PSEAEISHTQ KATLVCLATG  
FYPDHVELSW WVNGKEVHSG VCTDPQPLKE QPALNDSRYA LSSRLRVSAT  
FWQDPRNHFR CQVQFYGLSE NDEWTQDRAK PVTQIVSAEA WGRAD\*

**Figure 50a – Ser77→C  $\beta$  chain**

atgaacgctggtgtcactcagacccccaaaattccaggtcctgaagacaggacaga  
gcatgacactgcagtggtgccaggatataaaccatgaatacatgtcctggtatcg  
acaagaccagggcatggggctgaggctgattcattactcagttggtgctggtatc  
actgaccaaggagaagtcccaatggctacaatgtctccagatcaaccacagagg  
atttcccgtcagggctgctgtcggtgctcctcccagacatctgtgtacttctg  
tgccagcaggccgggactagcgggagggcgaccagagcagtaacttcgggcccgggc  
accaggctcacgggtcacagaggacctgaaaaacgtgttcccacccgaggtcgctg  
tgtttgagccatcagaagcagagatctcccacacccaaaaggccacactggtgtg  
cctggccacaggcttctaccccgaccacgtggagctgagctggtgggtgaatggg  
aaggaggtgcacagtgggggtcagcacagacccgcagccccctcaaggagcagcccg  
ccctcaatgactccagatacgctctgtagccgcctgaggggtctcggccacctt  
ctggcaggacccccgcaaccacttccgctgtcaagtccagttctacgggctctcg  
gagaatgacgagtggaaccaggatagggccaaaccgtcaccagatcgtcagcg  
ccgaggcctggggtagagcagactaa

**Figure 50b Ser77→C  $\beta$  chain**

M

N<sub>1</sub>AGVTQTPKF QVLKTGQSMT LQCAQDMNHE YMSWYRQDPG MGLRLIHYSV  
GAGITDQGEV PNGYNVSRST TEDFPLRLLS AAPSQTSVYF CASRPGLAGG  
RPEQYFGPGT RLTVTEDLKN VFPPEVAVFE PSEAEISHTQ KATLVCLATG  
FYPDHVELSW WVNGKEVHSG VSTDQPLKE QPALNDSRYA LCSRLRVSAT  
FWQDPRNHFR CQVQFYGLSE NDEWTQDRAK PVTQIVSAEA WGRAD\*

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**Figure 51a – Ser17→C β chain**

atgaacgctggtgtcactcagacccccaaaattccaggtcctgaagacaggacaga  
 gcatgacactgcagtgtgcccaggatatgaaccatgaatacatgtcctggtatcg  
 acaagacccaggcatggggctgaggctgattcattactcagttggtgctggtatc  
 actgaccaaggagaagtccccaatggctacaatgtctccagatcaaccacagagg  
 atttcccgctcaggctgctgtcggtgctccctcccagacatctgtgtacttctg  
 tgccagcaggccgggactagcgggagggcgaccagagcagtaacttcgggcccgggc  
 accaggtcacggtcacagaggacctgaaaaacgtgttcccacccgaggtcgctg  
 tgtttgagcca[61]gaagcagagatctcccacacccaaaaggccacactggtgtg  
 cctggccacaggcttctacccccgaccacgtggagctgagctggtgggtgaatggg  
 aaggaggtgcacagtggggtcagcacagacccgcagccctcaaggagcagcccg  
 ccctcaatgactccagatacgctctgagcagccgcctgaggggtctcggccacctt  
 ctggcaggacccccgcaaccacttccgctgtcaagtcagttctacgggctctcg  
 gagaatgacgagtggaaccaggatagggccaaaccgtcaccagatcgtcagcg  
 ccgaggcctggggtagagcagactaa

**Figure 51b Ser17→C β chain**

M

N<sub>1</sub>AGVTQTPKF QVLKTGQSMT LQCAQDMNHE YMSWYRQDPG MGLRLIHYSV  
 GAGITDQGEV PNGYNVSRST TEDFPLRLLS AAPSQTSVYF CASRPGLAGG  
 RPEQYFGPGT RLTVTEDLKN VFPPEVAVFE PCEAEISHTQ KATLVCLATG  
 FYPDHVELSW WVNGKEVHSG VSTDPOPLKE QPALNDSRYA LSSRLRVSAT  
 FWQDPRNHFR CQVQFYGLSE NDEWTQDRAK PVTQIVSAEA WGRAD\*

**Figure 52a – Val 13→C β chain**

atgaacgctggtgtcactcagacccccaaaattccaggtcctgaagacaggacaga  
 gcatgacactgcagtgtgcccaggatatgaaccatgaatacatgtcctggtatcg  
 acaagacccaggcatggggctgaggctgattcattactcagttggtgctggtatc  
 actgaccaaggagaagtccccaatggctacaatgtctccagatcaaccacagagg  
 atttcccgctcaggctgctgtcggtgctccctcccagacatctgtgtacttctg  
 tgccagcaggccgggactagcgggagggcgaccagagcagtaacttcgggcccgggc  
 accaggtcacggtcacagaggacctgaaaaacgtgttcccacccgaggtcgct[61]  
 [61]tttgagccatcagaagcagagatctcccacacccaaaaggccacactggtgtg  
 cctggccacaggcttctacccccgaccacgtggagctgagctggtgggtgaatggg  
 aaggaggtgcacagtggggtcagcacagacccgcagccctcaaggagcagcccg  
 ccctcaatgactccagatacgctctgagcagccgcctgaggggtctcggccacctt  
 ctggcaggacccccgcaaccacttccgctgtcaagtcagttctacgggctctcg  
 gagaatgacgagtggaaccaggatagggccaaaccgtcaccagatcgtcagcg  
 ccgaggcctggggtagagcagactaa

**Figure 52 Val 13→C β chain**

M

N<sub>1</sub>AGVTQTPKF QVLKTGQSMT LQCAQDMNHE YMSWYRQDPG MGLRLIHYSV  
 GAGITDQGEV PNGYNVSRST TEDFPLRLLS AAPSQTSVYF CASRPGLAGG  
 RPEQYFGPGT RLTVTEDLKN VFPPEVACFE PSEAEISHTQ KATLVCLATG  
 FYPDHVELSW WVNGKEVHSG VSTDPOPLKE QPALNDSRYA LSSRLRVSAT  
 FWQDPRNHFR CQVQFYGLSE NDEWTQDRAK PVTQIVSAEA WGRAD\*

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**Figure 53a – Asp 59→C β chain**

atgaacgctggtgtcactcagacccccaaaattccaggtcctgaagacaggacaga  
 gcatgacactgcagtggtgccaggatatgaaccatgaatacatgtcctgggtatcg  
 acaagacccaggcatggggctgaggctgattcattactcagttggtgctgggtatc  
 actgaccaaggagaagtccccaatggctacaatgtctccagatcaaccacagagg  
 atttcccgtcaggctgctgtcggctgctccctcccagacatctgtgtacttctg  
 tgccagcaggccgggactagcgggagggcgaccagagcagtagtctcgggcccgggc  
 accaggctcacggtcacagaggacctgaaaaacgtgttcccacccgaggctcgctg  
 tgtttgagccatcagaagcagagatctcccacacccaaaaggccacactgggtgtg  
 cctggccacaggcttctacccccgaccacgtggagctgagctgggtgggtgaatggg  
 aaggaggtgcacagtggggtcagcaca[box]cccgagccctcaaggagcagcccg  
 ccctcaatgactccagatacgctctgagcagccgcctgagggtctcggccacctt  
 ctggcaggacccccgcaaccacttccgctgtcaagtccagttctacgggctctcg  
 gagaatgacgagtggaaccaggatagggccaaacccgtcaccagatcgtcagcg  
 ccgaggcctggggtagagcagactaa

**Figure 53b Asp 59→C β chain**

M

N<sub>1</sub>AGVTQTPKF QVLKTGQSMT LQCAQDMNHE YMSWYRQDPG MGLRLIHYSV  
 GAGITDQGEV PNGYNVSRST TEDFPLRLLS AAPSQTSVYF CASRPGLAGG  
 RPEQYFGPGT RLTVTEDLKN VFPPEVAVFE PSEAEISHTQ KATLVCLATG  
 FYPDHVELSW WVNGKEVHSG VSTCPQPLKE QPALNDSRYA LSSRLRVSAT  
 FWQDPRNHFR CQVQFYGLSE NDEWTQDRAK PVTQIVSAEA WGRAD\*

**Figure 54a – Arg 79→C β chain**

atgaacgctggtgtcactcagacccccaaaattccaggtcctgaagacaggacaga  
 gcatgacactgcagtggtgccaggatatgaaccatgaatacatgtcctgggtatcg  
 acaagacccaggcatggggctgaggctgattcattactcagttggtgctgggtatc  
 actgaccaaggagaagtccccaatggctacaatgtctccagatcaaccacagagg  
 atttcccgtcaggctgctgtcggctgctccctcccagacatctgtgtacttctg  
 tgccagcaggccgggactagcgggagggcgaccagagcagtagtctcgggcccgggc  
 accaggctcacggtcacagaggacctgaaaaacgtgttcccacccgaggctcgctg  
 tgtttgagccatcagaagcagagatctcccacacccaaaaggccacactgggtgtg  
 cctggccacaggcttctacccccgaccacgtggagctgagctgggtgggtgaatggg  
 aaggaggtgcacagtggggtcagcacagaccccgagccctcaaggagcagcccg  
 ccctcaatgactccagatacgctctgagcagc[box]cctgagggtctcggccacctt  
 ctggcaggacccccgcaaccacttccgctgtcaagtccagttctacgggctctcg  
 gagaatgacgagtggaaccaggatagggccaaacccgtcaccagatcgtcagcg  
 ccgaggcctggggtagagcagactaa

**Figure 54b Arg 79→C β chain**

M

N<sub>1</sub>AGVTQTPKF QVLKTGQSMT LQCAQDMNHE YMSWYRQDPG MGLRLIHYSV  
 GAGITDQGEV PNGYNVSRST TEDFPLRLLS AAPSQTSVYF CASRPGLAGG  
 RPEQYFGPGT RLTVTEDLKN VFPPEVAVFE PSEAEISHTQ KATLVCLATG  
 FYPDHVELSW WVNGKEVHSG VSTDQPLKE QPALNDSRYA LSSCLRVSAT  
 FWQDPRNHFR CQVQFYGLSE NDEWTQDRAK PVTQIVSAEA WGRAD\*

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**Figure 55a – Phe 14→C β chain**

atgaacgctggtgtcactcagacccccaaaattccaggtcctgaagacaggacaga  
 gcatgacactgcagtgtgcccaggatatgaaccatgaatacatgtcctgggtatcg  
 acaagaccaggcatggggctgaggctgattcattactcagttggtgctgggtatc  
 actgaccaaggagaagtccccaatggctacaatgtctccagatcaaccacagagg  
 atttcccgtcaggctgctgtcggctgctccctcccagacatctgtgtacttctg  
 tggcagcaggccgggactagcgggagggcgaccagagcagtagtacttcggggccgggc  
 accaggctcacgggtcacagaggacctgaaaaacgtgttcccacccgagggtcgctg  
 tgggtgagccatcagaagcagagatctcccacacccaaaaggccacactgggtgtg  
 cctggccacaggcttctaccccgaccacgtggagctgagctgggtgggtgaatggg  
 aaggaggtgcacagtggggtcagcacagacccgcagccccctcaaggagcagcccg  
 ccctcaatgactccagatacgctctgagcagccgcctgaggggtctcgggcacctt  
 ctggcaggacccccgcaaccacttccgctgtcaagtccagttctacgggctctcg  
 gagaatgacgagtggaccaggatagggccaaaccgtcaccagatcgtcagcg  
 ccgaggcctggggtagagcagactaa

**Figure 55b Phe 14→C β chain**

M  
 N<sub>1</sub>AGVTQTPKF QVLKTGQSMT LQCAQDMNHE YMSWYRQDPG MGLRLIHYSV  
 GAGITDQGEV PNGYNVSRST TEDFPLRLLS AAPSQTSVYF CASRPGLAGG  
 RPEQYFGPGT RLTVTEDLKN VFPPEVAVCE PSEAEISHTQ KATLVCLATG  
 FYPDHVELSW WVNGKEVHSG VSTDPOPLKE QPALNDSRYA LSSRLRVSAT  
 FWQDPRNHFR CQVQFYGLSE NDEWTQDRAK PVTQIVSAEA WGRAD\*

**Figure 56a – Gly 55→C β chain**

atgaacgctggtgtcactcagacccccaaaattccaggtcctgaagacaggacaga  
 gcatgacactgcagtgtgcccaggatatgaaccatgaatacatgtcctgggtatcg  
 acaagaccaggcatggggctgaggctgattcattactcagttggtgctgggtatc  
 actgaccaaggagaagtccccaatggctacaatgtctccagatcaaccacagagg  
 atttcccgtcaggctgctgtcggctgctccctcccagacatctgtgtacttctg  
 tggcagcaggccgggactagcgggagggcgaccagagcagtagtacttcggggccgggc  
 accaggctcacgggtcacagaggacctgaaaaacgtgttcccacccgagggtcgctg  
 tgggtgagccatcagaagcagagatctcccacacccaaaaggccacactgggtgtg  
 cctggccacaggcttctaccccgaccacgtggagctgagctgggtgggtgaatggg  
 aaggaggtgcacagtgggtcagcacagacccgcagccccctcaaggagcagcccg  
 ccctcaatgactccagatacgctctgagcagccgcctgaggggtctcgggcacctt  
 ctggcaggacccccgcaaccacttccgctgtcaagtccagttctacgggctctcg  
 gagaatgacgagtggaccaggatagggccaaaccgtcaccagatcgtcagcg  
 ccgaggcctggggtagagcagactaa

**Figure 56b Gly 55→C β chain**

M  
 N<sub>1</sub>AGVTQTPKF QVLKTGQSMT LQCAQDMNHE YMSWYRQDPG MGLRLIHYSV  
 GAGITDQGEV PNGYNVSRST TEDFPLRLLS AAPSQTSVYF CASRPGLAGG  
 RPEQYFGPGT RLTVTEDLKN VFPPEVAVFE PSEAEISHTQ KATLVCLATG  
 FYPDHVELSW WVNGKEVHSC VSTDPOPLKE QPALNDSRYA LSSRLRVSAT  
 FWQDPRNHFR CQVQFYGLSE NDEWTQDRAK PVTQIVSAEA WGRAD\*